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THE
PARENTS'
CABINET
OF
AMUSEMENT
AND
INSTRUCTION



LONDON,
SMITH, ELDER & CO 65, CORNHILL

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London

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A NEW EDITION.

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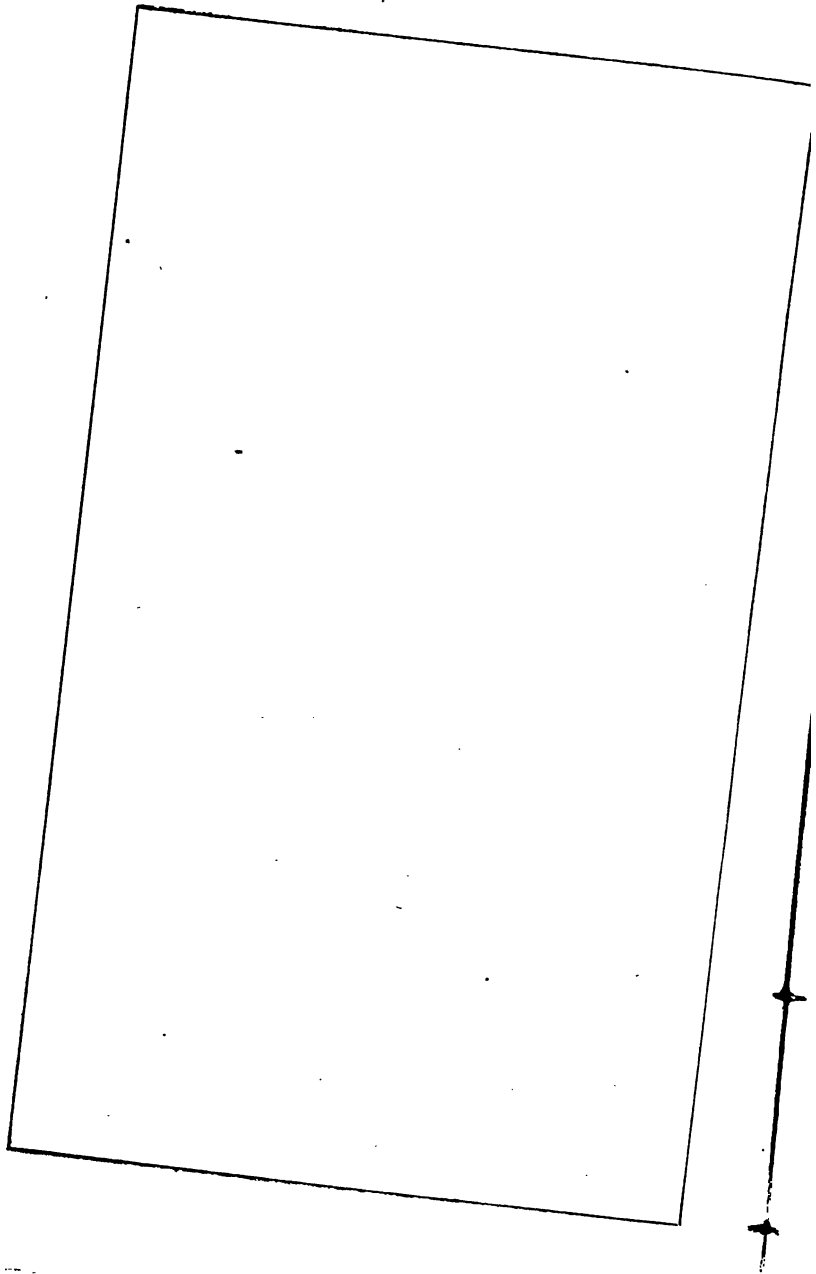
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THE PARENTS' CABINET

OF

AMUSEMENT AND INSTRUCTION.

BRAVE BOBBY.

THE American ship "Washington" was bound for China, filled with passengers, and a valuable cargo. Among the passengers on board this ship were an officer of the army and his wife, with their only child (a little boy of five years of age) and a large Newfoundland dog, called "Bobby."

Bobby was a great favourite with all the people in the ship, because he was so brave, so good tempered, so funny and playful. Sailors, as well as passengers, all liked brave Bobby. He would romp on the deck with anybody that chose. Sometimes, when the wind was calm, and the ship going slow, he would jump overboard, and dash through the sea after

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a biscuit, or any thing else, that might be thrown in for him.

But his most constant playmate was the little boy, the son of his master. This boy was a merry little fellow, and as fond of Bobby as Bobby was fond of him. They used to make a fine noise in their droll games of play, rolling over and over each other like a couple of young porpoises. And though the little boy was sometimes rather rough in his frolics with Bobby, and hit him on the head and back, yet Bobby was always gentle as a lamb to him.

The voyage had been very safe and pleasant until within three days' sail of the Cape of Good Hope. Evening was coming on, and the sun was setting in dark clouds; so that the dusk had commenced unusually early. The night-watch of the ship had been set, and the wind had risen, so that the ship was sailing very fast. The boy and the dog were romping together, tugging each other, and tumbling about, when all of a sudden the ship gave a heavy roll, and the child fell overboard, splash into the deep sea!

It had by this time become so dark that objects could not be distinguished many yards distant. A general cry of "A man overboard! a man overboard!" was made by the men on deck who saw the boy fall. Two or three men ran, heaving down lines, and a stray coop that was lying near the

BRAVE BOBBY.

capstan, while the officer of the watch sang out to stop the ship. "Bring the ship to, bring the ship to," cried he, "or the boy is lost!"

This order was scarcely given, when Bobby, now for the first time missing the child, gave a loud bark, and seeming to guess what had happened, cleared the taffrail like a shot; and the captain and the boy's parents, with the other passengers, who had come on deck to learn the cause of the outcry and bustle, saw the dog swimming away like a mad creature in the direction of the stern.

It was too dark to see him distinctly, but he was perceived to dive, and then dimly appear again above water, and snatch at something. It was, however, too dusky for anybody on deck to be quite sure what it was that he really saw. The dog was now out of sight, and nothing was visible but the surface of the water. The mother covered her eyes with her hand, not daring to look out, fearful lest she should see the corpse of her darling child borne upon the waves; while the father, equally unhappy, jumped into the jolly-boat, which the men in all haste had been getting ready, that he might spare no effort to recover his beloved son.

It was many minutes before the jolly-boat could be lowered and manned, for the Washington, being a merchantman, had not many hands to spare. But when the boat was manned and lowered, the men

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rowed with all their might in the direction they had seen the dog take at first. The darkness, however, had so much increased, that the sailors could hardly see, and began to give the child up for lost.

The father, in great misery, sat at the head of the boat, trying to see through the surrounding gloom, and listening anxiously to every sound. "I hear a splash, I hear a splash on the larboard quarter," cried he, starting up; "pull on, be quick: it must be my child."

The helmsman turned the tiller, the men pulled with redoubled force, and in a moment Bobby, with the child in his mouth, was alongside. Poor creatures! they were nearly spent when they were hauled into the boat. The father took the child in his arms, and the faithful Bobby sank down to the bottom of the boat, panting and almost lifeless.

The men then rowed back to the ship. Great, indeed, was the mother's joy when she saw her child, that she thought was gone for ever, in the arms of his father, and good Bobby with him also. They all got safe on board the ship again; and the father thanking the sailors for helping him to recover his son, went down to the cabin with the mother, child, and dog. Every remedy was used that the doctor of the ship advised to make the half-drowned boy quite well again.

Bobby, after he had shaken the water from his

BRAVE BOBBY.

thick shaggy coat, could not be persuaded to move from the child's side. There he stood licking one of his little hands till the child became so much better as to be able to stroke and hug him as usual. Brave Bobby seemed as happy as anybody, when both the father and mother hugged and praised him too. And when the boy could speak again, they made a happy little party in the cabin, where but a few minutes before, all had been so sad.

After this circumstance of saving the child's life in so brave a manner, there was not a man on board that ship but loved the dog as a father might love his child, and well did Bobby deserve it.

At the Cape of Good Hope some of the passengers were to be landed, and, among others, the master of Bobby, with his wife and child. The dog, of course, was to be landed also. All those who remained in the ship were very sorry to part with good Bobby.

The boats were prepared for the passengers and their luggage. All those who were to leave had got into the boats; the little boy was in his mother's lap, and Bobby, whom the sailors were holding, to pat and take a kind leave of, was just going to leap into the boat after his master, when the officer stood up and told the sailors to hold him tight by the collar until the boats should have rowed some way towards the shore. "You will see what a strong swimmer Bobby is," said he; "let us start before him, and he

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will soon overtake us. When I hold up my handkerchief let him go."

"Aye! aye!" cried the sailors, and two of them held Bobby tight by the collar. Poor fellow! he thought he was to be left behind, and he did not like it. He tugged, and hauled, and yelled, and barked, to get to his friends, but it was of no use. The boats put off without him.

When the boats were within a few strokes of the shore, the officer raised the signal, and some of the sailors called out "yeo-ho, halloa." The men on board the ship who held Bobby, loosed their hold, and dash went the fine creature, barking and splashing at a great rate, and swimming nobly and happily through the water after the boats. His quick swim was quite beautiful and wonderful.

All the people in the boats, as well as those on board the ship, were eyeing Bobby with delight; and he had just reached midway between the ship and the boats, when the creature set up a loud shrill howl, and threw himself half out of the water. Everybody thought he had got the cramp; but, oh, no! the flash of white that glanced like lightning close against him the next minute, told the truth; and "A shark! a shark!" sounded from boats to ship, and from ship to boats, in one loud cry. All stood trembling, with their eyes fixed upon the unfortunate dog. The boats stayed still for an instant, the men resting

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upon their oars, as if panic-struck. But again, in another instant, one of the boats was to be seen putting back, the men rowing with all their might.

Poor Bobby! he kept swimming away, right and left, now diving, now doubling, as if he knew his danger; while every now and then he gave a short fierce howl, and showed his grinders, never giving the shark time to turn on its back, which it must do before it can give the deadly bite.

The poor dog swam and dodged with a skill and a speed, and maintained the unequal contest in a manner that surprised everybody; but it was evident that his strength was nearly exhausted, when the boat, which had put back, came sufficiently near for him to hear himself called, and encouraged to hold out a little longer. In this boat were his master, and the little boy whose life the poor dog had so nobly saved three days before. They could now plainly perceive the black fins and back of the shark, as he rose every minute to the surface of the water, pursuing and trying to gripe the dog. The poor dog swam with all his might towards the boat that was coming to save him.

Just as he nearly reached the boat, and could see and hear his master calling out, "Here, Bob! here," the shark turned on its back, opened its horrid jaws—"Poor Bobby, dear Bobby!" shrieked the little boy; and a lad, who stood at the head of the

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boat, hoping to save the dog, threw a handspike that he held at the ravenous monster. But the lad was in such a flurry, from terror and anxiety, that he missed the shark, and the spike fell into the water.

At this failure the child screamed aloud with agony of fright and sorrow, "Oh! save poor Bobby! save my dear, dear Bobby!" and everybody thought poor Bobby was gone; when the father of the child, who, ever since the boat had come within gun-shot of the shark, had been watching for the proper opportunity to save the faithful dog, fired. The gun was levelled with so true an aim, that he shot the shark through the head, and splintered those horrid jaws that were opened ready to devour poor Bobby. The shark sank, the sea became tinged with blood, and the officer, throwing down the gun, stretched out his arms, and pulled the dog, exhausted with fatigue and terror, into the boat, before the shark, who was not quite dead, could again rise to the surface of the water. The child threw his little arms round the poor dog's neck; the sailors in the ship, who were all intently on the watch, and the men in the boats, set up one loud shout of joy. "Hurra! hurra! joy, joy! Bobby is safe, the shark is killed, hurra! hurra!"

A WALK IN THE GARDEN AFTER A SHOWER.

“MAMMA, the rain has left off, and the sun shines quite brightly,” said Charles Long to his mamma: “will you come and walk in the garden? I like you to be in the garden while I am running about.”

“Yes, Charles,” said his mamma, “I will come with pleasure.”

When Mrs. Long had put on her bonnet and shawl, she followed her little boy into the garden.

“Mamma,” said Charles, “is it not a pity to see the nice paths covered with all these little heaps of earth! The gardener says, that the worms make them. I think they are very mischievous creatures, do not you?”

“They do indeed spoil the neatness of our paths,” said Mrs. Long, “but they cannot know that. They build these little heaps to protect their young.”

“How, mamma?” said Charles, “I do not understand you.”

“The worms,” said Mrs. Long, “live in burrows in the ground, where they lay their eggs. In these

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burrows they also keep a few leaves, straws, or small plants for food, for themselves and their young ones. The worms close the openings to the burrows, because they fear that the rain might fill them and spoil their work; and also to prevent those insects from entering that live upon the eggs of worms, and the young worms."

"Do you know what those insects are?" said Charles.

"I do not know them all," said Mrs. Long, "but



I believe that fierce little black fellow, the Staphylinus, is one of them. You must have often seen the Staphylinus turn up its tail, Charles, when you have happened to place your foot near it."

"Oh, I know the insect you mean, mamma," said Charles: "if you touch it ever so gently, it opens its wide jaws and turns up its tail quite angrily. But, mamma, why is there a piece of a leaf at the top of most of these worm-hills?"

"Because, my dear," said Mrs. Long, "the worms like to close their holes with some young plant, or leaf, which they partly drag into their holes. When the plant is nearly decayed, it makes a delicious meal for their young ones. Worms like decayed or rotten leaves better than fresh leaves, and by

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dragging the leaf partly into their holes, they prevent its being blown away. But look, Charles, I will carefully remove one of these mounds, and we will watch what the worms will do."

Then Mrs. Long cleared the earth from one of the holes very gently.

"How will the worm find out that you have taken the covering away?" said Charles, "for there is no rain now to enter his little house. Oh, I know; he will see the bright light; for before you took away the earth he must have been in the dark. Is not that the reason, mamma?"

"It may be the reason," said Mrs. Long, "but I cannot be certain, for no one has yet discovered eyes in the earthworm. All that we know is, that the worms dislike the light; for when a light is held near them, they shrink into their holes, and therefore I think we shall soon see the opening mended."

"There is the worm, mamma," exclaimed Charles. "There he is! look how he peeps about as if he were afraid. He will not leave his hole. I can see something in his mouth, and he is sticking it round the opening. The worm seems to me, mamma, to suck in the earth, and then to squirt it out again, quite soft like mud. How quickly he works! Is not he a clever fellow?"

"Do not make a noise, my dear," said Mrs. Long, "or you will frighten it into its hole. Do you observe

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how neatly and smoothly the inside of the little hole is finished, while the outside is left quite rough?"

"Yes, I can see that quite plainly," replied Charles; "but how does he manage to make the inside so smooth?"

"I believe the worm uses its tongue as a trowel," said Mrs. Long. "See, Charles, the worm is crawling out; speak low, my dear, or it will hide itself."

"I suppose, mamma," said Charles, very softly, "that he is going in search of a leaf for the little door of his house. He is crawling over the flower-bed. There he goes. Oh, mamma, he has turned up one of your young stocks that have just come up; look at him; he has pulled it right into his hole, all but the little top of it that sticks in the clay; I do not like the worms to spoil your plants at all, mamma."

"We must try and prevent the mischief, Charles," said Mrs. Long. "If we put a few ashes round the young seedlings, the worms will not touch them, for they do not like to crawl over the rough ashes. Worms are very useful to us, though they sometimes spoil a few plants. By making holes in the ground they loosen it, and then the rain entering, nourishes the young plants. The roots of plants and trees grow better in earth that is frequently loosened than in hard ground. That is the reason why the gardener digs and hoes round the trees and plants so often."

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"Some of the worm-hills," said Charles, "have no leaves on the top; how then do these worms close their little houses?"

"They make use of a straw, or sometimes of a lump of clay," answered Mrs. Long.

"I think, mamma," said Charles, "that there are very few worms about, although there are so many little mounds. Why do they not come out of their holes?"

"They travel about at night chiefly," said Mrs. Long, "in search of food, and seem to prefer rainy weather. I have sometimes on a fine moonlight night seen the lawn covered with them. Those worms that live in holes on the lawn do not quit them, as the food is within their reach, but fixing their tails firmly in the hole, they stretch out their long bodies."

"I suppose, mamma, when they are frightened," said Charles, "they shrink suddenly into their holes."

"Yes," said Mrs. Long, "and sometimes as suddenly pass out. Worms are very fearful of the mole, who attacks them in their burrows; and the moment they feel the ground move, they dart to the surface of the ground. You may very easily see how soon they are alarmed, Charles."

"How, mamma?" said Charles, "I have never even seen a mole; how can I then watch the worm darting away from him?"

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"Because, my dear," replied Mrs. Long, "the worm is frightened at any sudden movement in the earth. If you ask the gardener to stick the pitchfork in the ground, near the place where he supposes there may be any worms, you will see that they will appear above the ground immediately."

"Oh, I will be sure to ask him," said Charles; "but I cannot to-day, for the gardener told me he should not be here again till to-morrow. I like to watch the worms, mamma. Shall we take off another mound to see whether the opening will be mended?"

"You can stay if you like, my dear," said Mrs. Long, "but this side of the garden is too damp for me to stand still longer."

"Then, mamma," said Charles, "I will show you my garden; that is nice and sunny. I have altered it since you were there last. Does not my new path look pretty? You see it divides my flowers from my lettuces, radishes, and mustard and cress. I should like to have a seat at the end of this path very much, and I am sure I can make one, mamma, if you will be so good as to give me that old board in the tool-house. May I have the board?"

"Yes, Charles," said his mother, "you may have it."

"Thank you," exclaimed Charles; "it will be quite large enough for you, mamma, and you will like to sit in my garden, shall you not?"

"Yes, my dear," answered Mrs. Long; "it will

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be very pleasant to sit and read in your little garden, while you are digging and weeding."

"And then when I have worked till I am famously hot," said Charles, "I can sit by your side to rest myself. Have you seen my poor apple-tree, mamma, that you gave me last year? All the blossoms seem spoiled, and I do not think I shall have one apple this year. See, mamma, the blossoms are all withered and stuck together."

Mrs. Long carefully examined the blossoms, and she asked Charles if he knew what occasioned the mischief.

"No, mamma," said Charles, "I do not; the gardener says it is the blight, but I do not know what he means by blight; and when I asked him, he looked up, and said it was in the air."

"My dear boy," said Mrs. Long, "the word blight has puzzled wiser heads than either the gardener's or yours. I believe gardeners call a frost, a cold wind, a great number of insects, or anything that injures the trees or plants, a blight. It was once imagined, that there were thousands and thousands of the eggs of insects floating in the air, as well as the smaller caterpillars, and that they appeared in large numbers in certain places, when brought there by a strong wind. But this is a mistake; for the parent insect, when at liberty, always lays her eggs where the young caterpillars may find proper food the moment

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they are hatched. These eggs are almost always covered with a sticky matter, to fasten them to the place where the mother insect lays them, and therefore they cannot be blown about by the winds. Your silkworm eggs are quite firm on the paper where your silk-worm moths laid them last year, Charles, are they not ?”

“Yes, mamma, quite firm,” said Charles ; “but do you think my apple-tree blossoms are spoilt by an insect, or by a cold wind ?”

“You will be able to tell me yourself, Charles,” said Mrs. Long, “if you will allow me to pluck off this bunch of blossoms from your tree.”

“Oh yes, mamma, you may take anything you like in my garden ; besides, I should like to know how all this mischief is done.”

While Charles was saying this, Mrs. Long plucked a bunch of blossoms. The flowers were all joined together by a fine cobweb ; and, as she carefully unfolded them, she asked Charles what he saw inside.

“A very small caterpillar,” answered Charles : “it has a green body and a little black head. But can this small caterpillar do so much mischief, mamma ?”

“Yes, my dear,” said Mrs. Long ; “from the moment it is hatched it begins to eat. It fastens the blossoms together to make a secure little house,

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and goes on eating and eating until it is ready for its change."

"I know what change you mean, mamma," exclaimed Charles eagerly; "I have never forgotten how insects change, since you let me keep silkworms. First, the egg is laid by the moth or the beetle, or any other perfect insect; then, when the egg is hatched, out comes the little caterpillar or maggot, which, after some time, leaves off eating, and becomes a chrysalis; it looks quite dead then, but by and by the skin cracks, and the perfect insect crawls out just like the one that laid the egg. Is it not so, mamma?"

"Almost, my dear," said Mrs. Long. "Some few insects, when young, have nearly the same shape as the parent, and only change their skin at different times. A few other kinds of insects resemble in their young state the parent insect, except in the wings, which they have not. But almost all insects go through three great changes—from the egg to the caterpillar or maggot, from the caterpillar to the chrysalis, and from the chrysalis to the perfect insect. One other thing you must remember, Charles. Some insects in their chrysalis or pupa state, as it is called, do not appear dead: grasshoppers, dragon-flies, and some others, continue to move about as briskly as before."

"And what is the name, mamma," said Charles,

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"of the perfect insect that has laid its eggs in my apple-tree, and when did it lay them?"

"I believe that the apple-bud-weevil is the name of the insect," said Mrs. Long, "and that it laid its eggs in the young flower-bud last autumn. It is a red insect, and may often be seen running up the branches of apple-trees in the autumn, searching for the flower-buds, and then is the time to prevent, by destroying them, the mischief they may otherwise occasion."

"Mamma, will you be so good as to draw me one," said Charles, "that I may know it when I see it? I will run into the parlour to fetch a pencil."

"I have a pencil in my pocket, my dear," said Mrs. Long, "and a card also. Look; this is the shape of the apple-bud-weevil. Weevils are something like beetles, only the head is more pointed, with this curious forked snout. And this is the shape of the chrysalis, and the caterpillar, or grub."



"Your drawing, mamma," said Charles, "is just like the caterpillar in the apple-blossom, but why do you call it a grub? I think it has the same shape as many other caterpillars that I have seen."

"If you look at its legs, Charles," answered Mrs. Long, "you will see but six in front, and the young of

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beetles and weevils, which are properly called grubs, have never more than that number. But the true caterpillars that change into four-winged insects, such as moths and butterflies, have not only six legs near the head, which are always armed with claws, but from two to sixteen legs under the body, that help them to cling closely and to climb quickly."

"But, mamma," said Charles, "what becomes of the grub of the weevil when the blossom of the apple falls off?"

"The grub falls also, ceases to eat, and buries itself in the ground, to remain there during its chrysalis state," said Mrs. Long; "after a few months it changes to the perfect insect. There are many other insects that destroy the apple-blossom, the fruit, the leaves, and the bark; but I do not see any of them at present."

"Thank you, mamma," said Charles. "I shall now know that mischievous weevil quite well. It is not cruel to destroy insects when they do mischief, is it?"

"No, my dear," replied Mrs. Long, "but we ought to be very careful to give them as little pain as possible, by killing them quickly. Some thoughtless people will leave a poor insect suffering for an hour after they have attempted to kill it: this is cruelty."

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"I hope the snails and slugs will not touch my young lettuces," said Charles: "I think I had better get some ashes and put round them, mamma."

"Yes, that will be a good plan," said Mrs. Long: "but what is that little heap of stones for in that corner?"

"Oh, mamma!" exclaimed Charles, "that is not a heap of stones! that is my frog-house. I have put a little piece of wood for a door, and the frogs are quite warm and comfortable there. Look at them; I will take away the door, and, if you stoop down, you will see them."

As Charles said this, Mrs. Long stooped down to look into his frog-house.

"One, two, three, four, five, six, seven, eight frogs!" exclaimed Mrs. Long. "Why, Charles, they are quite crowded; they cannot be comfortable in that small place; it is not larger than a garden-pot. They can scarcely have any air."

"Oh, yes, indeed, mamma," answered Charles, "they have plenty of air, for I take them out of the house very often, and give them a ride in my wheelbarrow."

"I think the jolting and shaking must be still more disagreeable to them than the confinement. Do you think it would be agreeable to you to be put in a small room, from which light and fresh air were shut

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out, with seven or eight other children, and only to be taken out in a great box for a short time, without being once allowed to jump or to hop?"

"No, mamma, I do not think I should like that," replied Charles; "but I am sure I try to make my frogs happy, for I have given them all kinds of leaves for their food. I suppose frogs are not often hungry, for they have not eaten one half yet?"

"No, that is not the reason," answered his mother. "Frogs do not eat leaves: they live upon insects, snails, small worms, and maggots. Your poor frogs that you thought were so happy must have been very hungry and very uncomfortable in their prison; they have not had the power to procure their proper food, while you have been filling their house with useless leaves!"

"I am sure I did not mean to starve them," said Charles: "I will let them out directly."

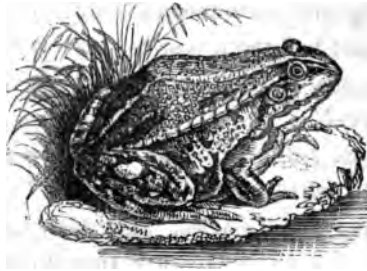
"That is right, Charles," said Mrs. Long; "it is better to lose a little pleasure than to hurt a poor animal."

As the frogs came out one by one, glad to regain their liberty, Charles said, "Mamma, one of the frogs looks as if he had a broken back; the middle is quite pointed; its skin is of a greener colour than the skin of the others, and it has, besides the dark spots like the other frogs, three stripes of yellow

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down the back. Is that a different kind of frog, mamma?"

"Yes," said Mrs. Long, "it is called the edible frog. Edible means good for food; and in Italy, Germany, and France, this kind of frog is eaten. I believe, however, the common frog is also frequently eaten, although it is not considered so nice as the edible frog. Both kinds of frogs live upon insects and worms, but the edible frog is so voracious and bold, that it will sometimes venture to attack and swallow young mice, and even young ducklings when they are just hatched."



"How strong it must be," said Charles: "but look, mamma, three of the frogs have hopped on that ant-hill. I don't think they will get any food there, for ants keep in their holes in rainy weather."

"Stop a minute," said his mamma, "and let us watch. I think the noise that the frogs make in

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moving so near the ants, will frighten them from their holes. Besides, although ants dislike very rainy weather, they generally work soon after the rain ceases, because the earth is moist, and they can press the little heaps that they carry into the shape they wish. They will even work in a gentle shower. See, Charles, the ants are now running about in all directions, and the frogs are darting out their forked tongues to seize all that come near them."



"But, mamma," said Charles, "the frogs move their tongues so very, very quickly, that I cannot see how they catch the ants. I wonder the ants do not tumble off."

"They cannot fall off," said Mrs. Long; "the tongue of the frog is covered with a sticky substance like paste, and therefore the moment the tongue touches the ant, it holds the ant quite fast. The tongue of the frog is differently placed to our tongues,

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Charles. It is fastened inside the *front* of the mouth, and not to the back; and when the frog is not using it to seize insects, it is turned back, with the tip towards the throat."

"I understand you, mamma," said Charles; "the frog packs up his tongue, something like I do when I roll up my tongue. If the frog did not turn his tongue back, there would be no room for the tongue in his mouth, and the tongue would be obliged to hang out. How many ants the frogs must have eaten while we have been talking! They dart out their tongues a great deal faster than I can."

"I have heard of a tame toad," said Mrs. Long, "that was fed upon flies and other insects. When its master held it in his hand near a window, it would sit quite still, darting its tongue with great quickness, while it swallowed fly after fly."

"Mamma," said Charles, "I should like to read about that tame toad. Do you think one of these frogs could be tamed?"

"I do not know, my dear," said his mamma.

Charles took up one of the frogs very carefully, and held it towards a fly that was settled on a bush; but the frog was frightened, and quickly jumped off Charles's hand.

"It will not stop on my hand, mamma," said Charles; "do you know how the gentleman tamed his toad?"

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“When we go in, Charles,” said Mrs. Long, “I will show you the account, and then you can read it yourself; but now let us walk quickly, or we shall get chilly.”

Charles ran for his hoop; and after he had gone several times round the garden, guiding his hoop carefully when he passed his mamma, he became quite warm, and then he and his mamma went into the house. He hung up his hat on the peg in the passage, and put away his hoop and stick, and then running into the parlour, said, eagerly, “Now, mamma, for the tame toad, please.”

Mrs. Long took a book from the book-case, and after marking several parts with a pencil, she gave it to him, and said she had marked those parts that she thought he would like to read.

“Thank you, mamma,” said Charles; “may I read it to you while you are working? I will begin with the toad.”

“You may read it to me, my dear,” said Mrs. Long, “but you had better begin with the common frog, because you will then understand it better.”

“Very well, mamma,” said Charles; and he began to read some account of the common frog, the edible frog, and the common toad.

“The common frog is seen almost in every damp place where the frog can find its favourite food, insects,

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small worms, and snails. Its fore feet are divided into four toes, and the hind feet are strongly webbed like the foot of a goose; that is, they have a skin stretched between each toe. The web assists the frog to swim. Frogs generally seek the water in very hot weather, and again in the beginning of winter. During the cold winter months they lie at the bottom of ponds, plunged in the soft mud, or in holes in the bank in a torpid state."

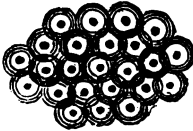
"I know what torpid means, mamma," said Charles, "you told me yesterday; very fast asleep for a long, long time."

"Yes," said Mrs. Long; "and during this time the animal neither eats nor drinks."

Charles continued. "In the northern parts of North America, when the cold is very severe, frogs have been dug up frozen as hard as ice. In this state their legs break like a piece of dry stick; but what is very curious, without awaking them from their torpidity. If, however, the injured frog be wrapped in flannel, and gradually warmed near a fire, it will recover its feeling, and soon come to life. Upon first coming out of their winter holes, frogs change their skin, and they continue to do so every eight or ten days during the summer. When the old skin has just peeled off, the frog looks of a brighter colour than usual.

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“The eggs of the frog may be seen in large clusters in the ponds in the month of March, like hundreds of white transparent beads, with a black dot in the middle. In the month of April a small tadpole is hatched from each of these eggs,



which at first is not at all like the parent frog. Indeed, no one who had not heard of the great change the tadpole goes through, could imagine that this strange looking animal could become a perfect frog. Tadpoles have a small fringe round the under lip, by means of which they can hang to the under surface of the leaves of the plants that grow in the water. While they live in the water they feed chiefly upon the duck-weed.



When the tadpole is about six weeks old, the hind legs make their appearance, and soon afterwards the fore legs. The tail being now no longer necessary, begins to get less, and at last falls off, and the little animal first ventures upon land. They are sometimes seen in such vast numbers, marching to some wood, or moist place, that the ground has been covered with them; and ignorant people have been very much frightened, thinking

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they came from the clouds in showers like rain. As soon as the tadpole has changed into the perfect



frog, it no longer feeds on leaves, but upon insects and small worms, and it therefore leaves the pond in search of food.* The young frogs travel all night, and conceal themselves during the day under stones, and in holes. When evening arrives, they again continue their journey. If, however, it

happens to rain in the day time, they will come out of their holes to refresh themselves. The common frog makes a low croaking noise in the evening, but not nearly so loud as the edible frog, and some other kinds. Both the common frog and the edible frog live about fifteen years. The edible frog is so much admired as a delicate dish in Austria,

* All these interesting changes can be observed in a fresh water aquarium, as well as many other habits of the inhabitants of our ponds. Care should be taken, by means of a floating island (made of a piece of cork) or by a piece of rock sufficiently large for the upper part to be dry, for the perfect frog or insect to be able to escape from the water. The glass or muslin at the top of the aquarium will prevent their leaving the aquarium itself till removed by the observer.

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that thirty or forty thousand are brought at a time to the city of Vienna. The people who provide frogs for the market keep them in large holes, covered over in the winter with straw. In these holes the frogs never become quite torpid. When large numbers of the edible frog are croaking together, they make so loud a noise as to be heard at a great distance. It is a larger kind of frog than the common frog, and much more courageous, but it is not nearly so often seen in this country. When pursued by a snake it will take immense leaps, croaking so sharply, that it sounds like the shriek of a child; but when closely attacked, it will never yield till forced by its enemy."

"Mamma," said Charles, laying down his book, "have you ever seen a frog climb a tree? I have; I watched one the other day, crawling up the cherry-tree that is trained against the wall near my garden. I think it was a young edible frog. It used its front legs just as I would use my hands and arms, and climbed from twig to twig, till he reached about the middle of the wall. It then fell down, and it did not try again."

"I have never seen a frog climb a tree," said Mrs. Long, "but I have often observed them climbing a wall where two walls meet, and supporting themselves by pressing their feet against both sides. There is a beautiful little green frog both in America

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and in Europe, that lives amongst the topmost branches of trees, where it swings from branch to branch, something like a monkey; but its feet are very differently formed to those of our frogs."

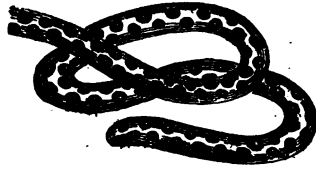
"I should like to hear about that frog some other day, mamma," said Charles; "but now we have come to the toad."



"The common toad so abounds in some parts of South America, as in Carthagen and Porto Bello, that in rainy weather not only the marshy ground, but the gardens, courts, and streets are almost covered with them. In these countries the toad is of great size, the smallest being at least six inches long. If it happens to rain during the night, it is then still worse; they crawl about in such great numbers that they nearly touch one another. On such occasions it is almost impossible to stir out of doors without trampling them under foot at every step. The toad passes the winter in ponds during its torpid state, or

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in hollows in the roots of trees. It is a dull heavy-looking animal, but the eye is beautiful. The hind-feet are only slightly webbed, the web not extending more than half way up each toe. It lays its eggs in the form of a necklace, not in clusters like the frog. The tadpoles become perfect toads in the autumn, when they may be seen by hundreds crawling up the bank of ponds, seeking a drier situation.



“Having found a place to suit them, each one for himself, they continue to live alone until winter; only venturing out in moist evenings. The toad is covered with small bumps, so that the skin is rough. When irritated it does not attempt to escape, but stops suddenly, swells its body, and presses from various parts of its skin a sticky bitter liquid which smells disagreeably. The bite of the toad and this liquid have generally been considered to be highly poisonous, but this cannot be true. It is well known that numbers of persons have handled toads without receiving any injury. The negroes of Senegal, in travelling across the burning sands of that country, are in the habit of applying a toad to their foreheads for the sake of its refreshing coolness. Both frogs

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and toads are always covered with moisture, though this moisture is more abundant at one time than at another. It defends their skin from the heat of the air and sun. The bite of the toad produces a slight inflammation that occasions no real inconvenience.

“Many anecdotes have been related of the extraordinary power of the toad to live without food, and almost without air, even for years. It is difficult to discover the truth or error of these accounts; but we know from the experiments of a French gentleman, that out of three toads which were shut up in boxes securely covered with plaster, *two* were found alive at the end of eighteen months.

“Neither toads nor frogs are difficult to tame. Both may soon be taught to be taken in hand and carried about without fear. A gentleman in Devonshire kept a tame toad, which continued in his garden for nearly thirty-six years. It was generally found near the steps of the hall door. By being constantly fed, it became so tame as always to come out of its hole in the evening when a candle was brought, and to look up as if it expected to be carried into the house, where it was frequently fed with insects. It appeared most fond of maggots, which were kept for it in bran. When the maggots were placed on the table, it would fix its eyes on them, and remain quite still for a moment, and then dart out its tongue so quickly, and swallow the maggot so

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instantly, that the eye could not follow it. The motion was faster than winking the eye. This favourite toad was injured by a tame raven, who seeing it one day peep out of its hole, pecked an eye out, and although the poor toad lived a year after, it never recovered from the wound."

"Oh, mamma, how sorry I should have been," exclaimed Charles. "I will try and tame a frog. You see, mamma, the book says that both frogs and toads can be easily tamed. I should like to see the frog come out of its hole to meet me. I should then be quite sure it was happy, because if it did not like to stay it could hop away."

"Yes," said his mother, "I think that is a very good plan; and now that you have finished reading, my dear, be so good as to ring the bell for tea."

THE BROKEN PUMP.

“COME, George, wake up,” said Frederick Harmer to his brother early one fine spring morning; “we must have a good day’s work in our new garden. The ground is almost as hard as iron, and we had better dig while it is cool. Don’t you hear me; don’t you understand?”

“Yes, I understand,” answered George, in so sleepy a tone that his brother quite laughed at him. The laugh woke George a little more, and after rubbing his eyes and gaping a few times, he sprang out of bed, declaring he should be ready as soon as Fred.

When the boys were dressed they went into the garden together. The new piece of ground which their father had given to them the day before was an additional piece to their former gardens. Mr. Harmer had now marked out for their use a large border, twenty-four feet long and nine broad; for he had observed with pleasure that the boys had raised many well-grown vegetables and flowers, and that they generally kept their gardens in neat order.

THE BROKEN PUMP.

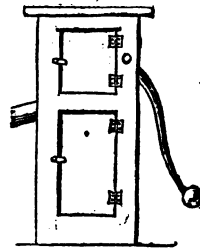
The boys determined to plant this new piece with vegetables and fruit trees ; but before they made any plan for arranging the various beds and paths, they intended to dig it all over. They began to dig with hearty good will, but made very little progress, for the ground was so hard that they could scarcely force their spades in.

"This will never do," said Fred, "we shall not dig it up in a week at this rate. We have just two hours to work before breakfast, and we shall have scarcely any part dug up to show papa. Let me think, what can we do? Oh, I know: we will water it, George, to soften the ground."

"I will run to the pump in a minute, and bring the two watering pots," said George; "and you had better fetch the large spade, Fred."

While Fred went to the tool-house, George ran to the pump, but though he could move the pump handle more easily than usual, no water came out of the spout, and he returned to his brother, exclaiming, "How vexatious, Fred; we shall not be able to dig our garden before papa comes down to breakfast—there is no water in the well."

"How do you know there is no water?" asked Fred.



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"Because I have pumped and pumped till I am tired, and I cannot bring up any," answered George.

"We will go to the well and drop some stones through the hole in the cover, and then we can easily tell by the sound whether the well is dry."

The boys picked up some small stones and went to the well, which was covered over with a wooden lid and locked with a padlock. A knot in the wooded lid had fallen out, and they could easily drop the stones through the hole. As they let the stones fall one by one, George was surprised to hear splash, splash, splash.

"It is very odd," said he, "that I could not pump up water when there is plenty in the well. What can be the reason, Fred?"

"I should think there must be something the matter with the pump," said Fred; "we will see if we can find out."

"But," said George, "how can we find out what is the matter, when we know nothing about the different parts of the pump. I have never seen the inside, have you?"

"Yes; I have seen the inside two or three times," replied Fred; "and one day last week (I think it was the day you were at my uncle's) papa explained the different parts of a pump to me, and he allowed me to take out the bucket, and so I know he will not mind

THE BROKEN PUMP.

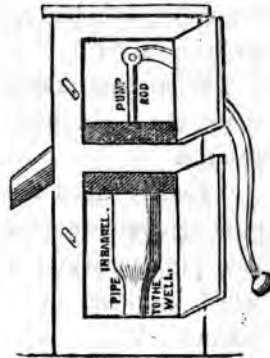
me taking it out now. Look, George, you can see some parts of the pump now these two doors are open. The pump handle is fastened to this upright iron rod by an iron pin, and when I move the handle up and down, the pump rod, as it is called, goes down and up."

"I can see that quite plainly," said George; "but I want to see the bucket you spoke of, Fred."

Fred took out the pin which fastened the handle and the pump rod together, and drew out the pump rod. At one end of it was a round lump of wood, with a piece of leather nailed round it. In the middle of this lump of wood was a round hole with a little trap door of leather, which opened upwards.

"Do you call this thing a bucket?" said George; "why I expected to see you bring a pail out of the pump; this is not like a bucket. No bucket could hold water with a great hole right through it, Fred."

"I know this bucket is not like what people



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usually carry water in," replied Fred, "but papa told me that that was the proper name, and I heard the plumbers call it so. This lump of leather that covers the hole like a little trap door, papa told me is called a valve."

"What is this thick part of the pipe called, Fred, that I can see in the lower part of the pump?" said George.

"That is called the barrel," replied his brother; "though you see, George, it is more like two quart pots put one above another than a common barrel, which is thicker in the middle than at the top and bottom. When we move the handle of the pump up and down, the bucket moves up and down inside the barrel which it is made to fit."

"But I wonder the leather round the bucket does not make it stick fast," said George, "because when leather is wetted, it swells and takes more room."

"Yes," said Fred; "I know that, and it is on account of its swelling when wet that it is so useful. The bucket is made just to fit the barrel easily, so that when the leather is wetted it may press softly against the inside of the barrel; and the water cannot then run down between the leather and the barrel. But look, this leather is quite dry, and a part of it is rotted away. I dare say that was the reason the pump would not work. This empty place,

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where the leather is worn off, must have let all the water through, and then no doubt the leather got dry, and would not press properly against the sides of the barrel. I am almost sure I can mend this bucket with a piece of an old shoe that you have done wearing, George. I will run to papa's dressing-room, and ask him if I may try."

"Oh, do," said George; "and I will find the shoe by the time you come back."

Mr. Harmer gave the boys leave to try their experiment before he sent for the plumber, and the shoe was soon found. Fred cut it neatly, and nailed the leather over the bare part of the bucket. The boys then soaked the leather round the bucket in a pail of rain water that stood in the garden, and ran to the pump with the mended bucket. Fred placed the pump rod and bucket inside the pump, and fastened the pump rod to the pump handle with the iron pin.

"Now, George," said he, "work away, my boy."

George began pumping, but he said "The handle does not move half so easily as it did, Fred."

"So much the better," answered Fred; "we have made it fit better then; hurra! here comes the water, George; pop the water-pot under the spout."

"How lucky it was, Fred," said George, "that you remembered what papa told you last week; we have a good hour now before breakfast."

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The boys carried water-pot after water-pot of water to their garden, moistening about one-third of the new ground. Then they began digging again, and were delighted to find how easily they dug up the ground which was so very hard till they watered it. After they had been digging some time, George said to his brother, "Though you have told me about some parts of the pump, Fred, I do not in the least understand how that bucket brings up the water. Did papa tell you?"

"Yes, he did," replied Fred: "I am not sure, however, that I can explain it well to you. But when we go in to breakfast I will show you the little drawings of the pump papa made for me, and I will try to make you understand the matter. Do you think, George, you can recollect the names of the parts of the pump that you saw?"

"Oh, yes," said George. "The handle is fastened to the pump rod. At the lower part of the pump rod is the bucket, which moves up and down inside the barrel. At the bottom of the barrel is a leaden pipe about as thick as a rolling-pin which goes from the barrel into the well; then there is something like a square leaden box at the top of the barrel which holds a good deal of water, and the spout sticks out from the box."

"That box is called a cistern," said Fred, "but there is another part of the pump that I have not

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told you about, which is very useful indeed. It is called the sucker, and is fixed quite tight at the bottom of the barrel, and never moves. It is a lump of wood with a hole through it as in the bucket, and a leather trap door, or valve, which opens upwards just like the valve of the bucket."

"I am sorry you cannot show me that, Fred," said George, "but I suppose as it is fixed inside the barrel, you cannot take it out. Well, when we go in you must show me the drawings of the different parts, but I like seeing the real things best."

"So do I," said Fred.

When the boys went in to breakfast, they were much pleased to tell their father of the success of their experiment. They had worked hard, and had dug up a third part of their new ground. After breakfast they both begged their father to explain the pump to them, "because," said Fred, "I am not sure, papa, that I shall be able to make George understand."

"Try, Fred," said his father. "If you recollect well, I have no doubt you will, and as I have an engagement with a friend, I cannot stay now."

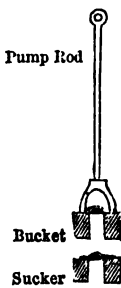
When Mr. Harmer had left them, Fred went to his little desk, and showed George the drawings. "Look, George," said he, "you must first understand that these drawings are called *sections* of the different parts of the pump."

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"You need not explain that word (*section*)," replied George, "for I know what it means. Any thing cut right through the middle is called a section. If I cut this stick from top to bottom, I make a section; and if I cut this loaf of bread through, I make a section."

"Well then," said Fred, "papa has made a drawing of the inside of the pump and its different parts, that we might understand it, just as if a real section were made from top to bottom.

"There are the pump rod, bucket, and sucker. The sucker is fixed at the bottom of the barrel. The bucket with the rod moves, as I explained to you in the garden, up and down in the barrel, when the pump is worked. Those little black things are the valves which open upward. To make me see more distinctly the difference between the drawing of a whole thing, and of its section, papa made this next little drawing. This is a view of the sucker, not a section of it.



"When the water is above the valve, you know, the valve must keep close.

When the water is below the valve, the valve must be forced open. When papa explained to me the reason of the water rising in the pump, the most difficult thing to understand was what papa called

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the 'pressure of the air.' The air presses on every thing....."

"Why," said George, "do you think that difficult to understand, Fred? I know the air presses against the sails of our boat and pushes it along, and against the sails of the windmill too. I do not think *that* is difficult to understand or remember."

"When papa," said Fred, "was talking to me about the pressure of the air, I thought of the windmill, and the sails of the ships too; but still that is not the proper explanation of the pressure of the air, for the air presses on everything, not only when the wind blows but when the air is quite still."

"What," asked George, "when the day is quite hot and sultry, and we feel no wind at all?"

"Yes, always," said Fred; "and you can be sure of that, George, if you run quickly on a hot day, for you will feel the air like a slight wind on your face, because you press against the air in running. I tell you what I think the pressure of the air is something like, George. Water, you know, is heavy; and in the great sea, in the rivers and in the ponds, it presses on the stones, the fish, and the weeds, whether there is a storm or whether there is a calm. It does not signify in the least whether the wind blow or not, the water presses with the same weight on the different things in the water."

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"But," said George, "I know that water is heavy, for a pail of water weighs a good deal, but does air weigh anything?"

"Yes, it does weigh something, but not nearly so much as water. If we had a pipe thirty feet high filled with water, and another pipe of the same size that was thirty *miles* high filled with nothing but air, the water in one pipe, and the air in the other, would weigh nearly alike."

"But does the air go up so very far above the clouds?" said George.

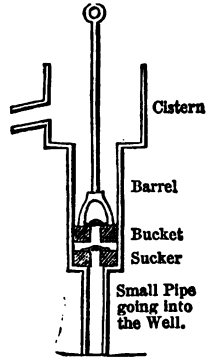
"Yes," answered Fred, "papa says it goes up even higher than thirty miles, but beyond that height it has scarcely any weight; it is sufficiently near the truth, therefore, to say that there is thirty miles of air always pressing on the surface of the well, and upon all other objects around us. If we put a pipe into the water, and get the air out of the inside of the pipe, the air that is pressing so heavily *outside* the pipe on the surface of the water in the well, will force the water up the pipe."

"Well," said George, "I think I can understand now how it is. I draw the water from a cup into my mouth through a straw; I have often done that till I have quite emptied the cup. I somehow draw the air out of the straw, and the air outside the straw presses on the surface of the water in the cup, and

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pushes it into the straw. But how does the pump, Fred, draw the air out of the pipe?"

"Why, first of all, suppose, George, the pipe has no water in it," said Fred, "and suppose the bucket at the lower part of the barrel, as in this little drawing. Well, when you lift the bucket, some of the air in the pipe comes through the valve in the sucker into the barrel. As soon as you stop lifting the bucket up, the sucker valve closes and prevents



the air going back again into the pipe. When you push the bucket down, the air that you have just got into the barrel pushes open the valve in the bucket, and goes through the valve into the cistern, and then through the spout into the open air. As soon as the bucket has got to the bottom of the barrel, the bucket valve closes, and when you again lift the bucket, some more air comes from the pipe through the sucker valve into the barrel; and so you keep on till you have taken all the air out of the pipe going into the well."

"And then," said George, hastily, "I know what happens, for while the air is being pumped out of the pipe, the outside air keeps pressing on the surface of the water in the well, and pushing it into the empty pipe; so that, I suppose, by the time the air is all

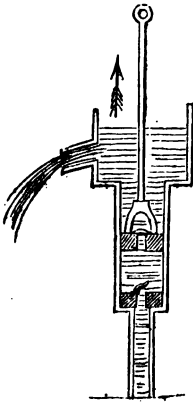
THE PARENTS' CABINET.

out of the pipe, the pipe is full of water, and then the water goes through the valves exactly in the same way as the air did."



"Yes, you are quite right, George," said Fred; "look at papa's drawings and you will not forget it. These little arrows are placed on the side, George, to show which way the bucket is moving. See, in this drawing the arrow is pointed downwards."

When we lift the handle of the pump, we push the bucket down, and the valves are in this position. In the next, the arrow is pointed upwards. When we pull the handle down, the bucket is lifted up, and the valves are in this position."



"I am almost glad, Fred," said George, "that we could not pump up the water, when we first tried this morning. I never thought about the inside of a pump before. It is very curious and very entertaining. I wonder,

Fred, if you and I could make a small real pump; I should like it so very much."

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"Yes; I think we could," said Fred. "We could make a small pond well lined with clay for our well, and lay a pipe from it to our pump. I have thought also of something else for our new garden."

"What is that?" said George.

"A fountain to fall in tiny showers over our plants like the fountains in the Zoological Gardens. Only ours will be very small compared to those."

"Oh! that would be beautiful," exclaimed George, "but, Fred, how can you manage that?"

"I must ask papa first to lend me the book of plates that contains drawings of pumps, fountains, and all kinds of things, for I am not sure I know the best way yet; but, George, we will talk of that by and by, for, look, it is near ten o'clock, and we must be off to school, and we have plenty of work before us for the present, without thinking of fountains. Stop one moment while I put the drawings into my desk, George. Now I am ready."

"And so am I," said George. And the two boys started together to school.

ROBERT WILMOT.

“You always like to have your own way,” said Edmund Wilmot to his brother Robert, who was piling up some stones to form a grotto in the garden; “and if we begin our work ever so happily, we are sure to quarrel before long. Why may not I place some of these stones as well as you, Robert?”

“Because I know how to put each stone into its proper place, a great deal better than you do,” answered his brother.

“You cannot tell that, till you have seen how I place them,” said Edmund.

“Nonsense! how can you suppose that I do not know better than you?” demanded Robert, in a high tone—“I, who am ten years old. But it does not signify talking; the long and the short of it is, I shall place the stones myself.”

“Then I think you are very disagreeable,” said Edmund.

“You can wheel the stones in the barrow, if you choose,” said Robert, as he continued smoothing

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with his light trowel the mud plaster that he laid between the rock-work.

“No,” said Edmund, “you know that the plastering is the pleasantest part of the job, and if you will not let me do some of it, I shall not bring the stones. It is too bad of you to leave me all the hard work.”

“Who wants you to do the hard work?” returned Robert. “I can build the grotto very well myself.”

Edmund made no answer, but he walked away disappointed and vexed. Robert did not attempt to detain his brother, although the moment after, he felt that he had not acted rightly, and that his own love of domineering had, as usual, interrupted their play.

The stones, bricks, and other materials, were in a heap in a lane near the end of the garden; and from the garden, there was a gate that opened into the lane.

The day was very hot, and Robert found the labour of repeatedly loading the barrow and wheeling it to the grotto, by no means pleasant. He soon became tired of his work; but as his brother was sitting under a tree near the grotto, he did not like to show his fatigue, so he continued labouring in the hot sun for some time. At last he threw down his trowel, and exclaimed, “How horridly hot it is; the grotto will not be done to-day!”

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"Then let us work together," said Edmund, jumping up from his seat, "turn and turn about. I am quite willing to take my share of the hard work."

"Come along then," said Robert.

After this agreement the boys worked happily together. Edmund good-naturedly fetched the first two barrowfuls of stones, and when his turn came to plaster, shewed the utmost readiness to follow his brother's advice as to the best position for each piece of rock-work. The grotto proceeded rapidly; and Robert felt that he had acted both foolishly and unkindly at first, in attempting to make his brother do exactly as he chose.

It must not be supposed that Robert Wilmot was a cross, ill-tempered boy. When his love of having his own way did not interfere with his other good qualities, no boy could be more agreeable. He was so trustworthy, so ready to oblige those he loved, and so obedient to his parents, that he was generally esteemed, but all his friends declared that they should have loved him much more, if he had not disputed so much about trifles. The ill effects of this disposition were felt much more by his companions than by his parents; for he could not order his parents about as he did his companions. Notwithstanding Robert's well known ready talent in inventing games, and planning new amusements, he

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began to be shunned by his playfellows, for, as Edmund truly said, "however happily the games might begin, they were very frequently spoilt by Robert's resolving to have his own way." Edmund, who was a year younger than Robert, and very fond of him, would often speak to his companions in his defence, urging for him that no boy in the village was more active than Robert in assisting at their sports, nor more generous in lending his balls and bats.

"I am sure it is not kind of you to leave Robert out," said Edmund one day to Frank Collins, who was inviting him to meet a young party at his house, and who had purposely omitted Robert. "That is not the way Robert treats you. When papa wished to take us to the Zoological Gardens, and said we might have a friend with us, Robert refused to go, because he found that you could not go with us, although papa said it would be some time before he could spare another day to take us. I had seen the Zoological Gardens, but Robert had not. Do you not remember that you had both been quarrelling only the day before? yet he forgave *that*, when he refused to go without you. Was not *that* kind of Robert?"

"Yes," said Frank Collins, "it was very kind indeed of him, and I am sure it made me try to put up with his commanding ways for ever so long afterwards. But it is really, Edmund, so unpleasant

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to have our parties spoilt by him, that I cannot ask him for to-night. But you may come, Edmund: we shall be glad to see you."

"No," said Edmund, "if Robert must not come, I would rather not. I could not bear to be enjoying myself, while he is staying at home."

"Oh, do come," said Frank, "it will be a rare good party, Edmund; and we are going to let off a fire-balloon, and after that some fire-works."

"No, thank you," said Edmund, "I won't come without Robert."

"But we shall all be so sorry to lose you," said Frank.

"Oh, never mind about that," said Edmund; but his voice faltered as he spoke, for he did not at all like to lose so much pleasure, though he had quite made up his mind.

"Well," said Frank, hesitatingly, "I cannot let you stay away, so I will ask Robert. Tell him we shall have a good many boys, and plenty of fun: mind and come early."

"Oh, yes; I will be sure to remember," said Edmund in a joyful tone, and he ran home to tell his brother of the intended party.

Robert was greatly pleased at the invitation, for Mr. Collins was so agreeable a man, and generally joined so much in his son's amusements, that the parties at his house were always delightful. Directly

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after dinner the boys got ready to go. Before they left home, their mother whispered in Robert's ear, that she hoped he would be careful not to offend his companions by trying to be the first in every game; and, she observed, that as Frank Collins had invited his friends to entertain them, it would be kind, as well as polite, to allow him to propose the games himself.

Robert nodded, and looked so happy and good-tempered, that his mother thought she could depend upon his good conduct. He kissed the baby, and told Ellen that if she looked in the play-room, she would find her doll's bedstead mended, so that she might play with it while they were away.

"Oh, thank you," said little Ellen, "that is kind of you."

The boys then set off on their walk to Mr. Collins'. Edmund rejoiced that they were together, and he skipped from mound to mound in very glee. He did not tell his brother of what had passed between Collins and himself.

When they arrived at Mr. Collins', Frank came out to meet them, and led them into the garden, where several boys were vaulting with a pole over a stretched rope. The party quickly increased, and at last twelve or fourteen boys assembled, and were soon in high fun together. At the sound of a bugle horn which Frank gave Edmund to blow, the boys

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ran to the end of the garden. There they found, on the grass-plot, three or four tables spread with tea, cakes, and other good cheer. Mr. and Mrs. Collins joined their young friends, and added much to the amusement of the party, by making jokes and relating funny stories. The boys declared that Mr. Collins' grave stories were as hard to be believed as those told in jest. Who ever heard of people living in trees day and night, wearing wooden dresses, procuring bread and tallow from trees, eating earth, and a hundred other things that Mr. Collins declared to be true? Now and then Robert, who was a well informed boy for his age, could explain some of these wonders, and then they all joined in shouts of laughter against Mr. Collins, for failing in his attempt to puzzle them.

After tea, the games continued with fresh spirit. Mr. Collins asked the boys if they ever played at the game of the bear, and selecting six of the younger boys, he said they should be the bears, and he would be the pole. He threw off his coat, buttoned his waistcoat tight, and placing an apple in his right hand, held it high above his head: he said that each boy was in turn to climb up him and attempt to reach the apple, which should be the prize of him who could get it. All the boys declared that nothing could be easier, and bargained that if all six touched the apple, they were to have one a-piece.

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“Oh, certainly,” said Mr. Collins; “now my lads.”

It was soon plainly seen that it was by no means an easy thing to reach even to Mr. Collins' shoulder. Boy after boy struggled, and struggled, while the by-standers shook with laughter at the red faces and panting breath of the young climbers. One advised them to hold fast, another to make a good spring, while a third begged them not to give up so soon. In spite of all their exertions, the bears slid down faster than they climbed up, and out of the six one only secured the prize.

The rest of the boys were now very anxious for a trial, but Mr. Collins declined the embraces of full grown bears. He fixed for them, however, a high pole which was made to sink in a deep socket in the grass plot, and in a minute, two or three were trying their skill on its smooth surface.

After this, they were rather at a loss for a game. They had played at base-ball and leap-frog; and rival coaches, with six horses at full speed, had been driven several times round the garden, to the imminent risk of box-edgings, and the corners of flower-beds: what were they to do next? Robert knew a French game, but he remembered his mother's advice, and waited till Frank Collins said he could not think of any new amusement. He then proposed “the sea and her children.” This game Robert told

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them was frequently played amongst grown-up people at Paris, and he thought it was a very good one.

“How do you play at it?” inquired everybody at once.

“Why, first, you must place chairs for all except one. The chairs should be put in a line, back to back. Then the boy who is to represent the Sea asks each of the others by what name he chooses to be called; whale, shrimp, shark, stickleback, salmon, dolphin, or any other name. When the Sea has learned all the names of her children, she suddenly calls out to one of them to follow her. “Shrimp, shrimp, follow me:” then another, or half-a-dozen of them, or, if she likes, the whole. The fun is, to lead them into all kinds of difficulties, just like “Follow my leader,” because they must imitate the Sea in all her movements. Then in a moment she calls out, “Home, home, home!” and all rush to their seats. The boy that is left out, of course becomes the Sea. The names are to be changed whenever there is a fresh leader.”

“Oh, let us play at that,” said they all, “and do you be the Sea, Robert.”

The game went on with different leaders for a considerable time; but all declared that Robert made the best leader. It was now growing dusk, and Mrs. Collins invited them in to supper. Hitherto nothing could have surpassed the good humour of the whole

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party. It was true, that in the midst of their play there had been several sharp knocks, but nobody cared for them, and the party sat down to supper in good spirits, and with excellent appetites.

Immediately after supper, Mr. Collins let off the fire-balloon. It steadily ascended for some time, and was then carried by a gentle breeze over a common that joined Mr. Collins' garden. It looked like a deep red ball of fire, till it gradually diminished to a small red speck.

"I thought fire-balloons were rather dangerous things, sir," said Robert to Mr. Collins, "I have heard papa say that hay-stacks have been set on fire by them."

"Yes; that has been the case sometimes," replied Mr. Collins; "but I have guarded against any danger to-night. There are no hay-stacks on the common, and long before the balloon has passed over the common, the spirits of wine will be exhausted; unless the wind had blown in the direction of the common, I should not have ventured to have sent up the balloon. But now for the fire-works, boys."

Robert had brought with him some fire-works which he had made himself. He, therefore, thought he might certainly give directions about them. But not content with that, he gave so many orders about the rest of the fire-works, as to the best way of

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letting them off, and found so much fault, that the boys did not like it.

"Do not you see," said he, "that you are wasting all the squibs, when you might make beautiful stars with them? Will you listen to me? How silly you are!" he continued, as one boy after another passed him with "whiz, whiz, whiz, bang."

"Will you hear me speak?" he bawled out, as a fresh group passed him in high fun.

"Well, what?" said one of the boys.

"Why, look here, if you cross two squibs, and put a pin through the middle of them, and fix them to a tree, and light both ends, you will see quite a bright circle of light."

Saying this, he fixed two squibs on a pin, and stuck the pin into the bark of a tree. He then lighted the ends of the squibs. One, however, would blaze before the other, and the boys laughed at the one-sided affair.

"Try two others," said Frank Collins; "I do not think you will manage it, though; for papa tried several times, one night. If the gunpowder is not rammed exactly as tightly in one squib as in the other, it won't do."

Robert pinned two more squibs to the tree, but this trial succeeded no better than the last. One squib obstinately remained, with a smouldering spark in it, while the other blazed away, and only

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commenced burning after its companion had gone off.

“How provoking!” exclaimed Robert.

“Oh, never mind,” said the boys, and they began squibbing one another again round the garden.

Robert then said he would lay a train of gun-powder; and he gave a dozen commands to the boys to keep away from the path where he stood. So many, however, paid no attention to his words, that he became quite vexed.

“Well,” cried he, “all I say is, you will be burnt, and then it will not be my fault.”

“You had better give up the train, Robert,” said Frank Collins; “they are all too busy to think about the danger. It would be a pity to do anything that might hurt the little ones.”

“But it is so tiresome,” said Robert, “that they will not do as one asks them. I am sure I have told them not to come this way a hundred times.”

“Why as to that,” replied Frank, “you know it is only you who care about this train. If you are tired of squibbing, there are plenty of catherine-wheels and blue lights.”

“Well, I shall fire this train first, to please myself, if no one else,” persisted Robert, and he held the lighted paper to one end of it.

At the very instant it began blazing, a little boy, who was running very fast, and knew nothing about

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the train, crossed over it, and his leg was severely scorched.

The brave little fellow tried to bear the pain without roaring, but his cheeks tingled, and his eyes filled with tears, as he said, "I must go in-doors, I can hardly bear the pain."

"There, Robert!" exclaimed Frank, "see what your resolving to have your own way has done!" and he took up the child in his arms, to carry him into the house.

Robert was generally a humane boy, and anxious to assist any one who suffered; but Frank's expression, although quite true, hurt his pride, and he answered in a fierce ill-tempered tone, "Then he had no business to come down this path; I called out often enough, I am sure; it is not my fault."

"For shame, for shame!" said Frank.

"I did not hear you tell us not to go there," said the little boy, "there was such a popping and banging; but I dare say my leg will be better soon."

Frank took the child in-doors to Mrs. Collins, who bathed the leg with soft linen rags, dipped in spirits of turpentine. After a little time, the pain considerably abated, and Mrs. Collins placed him on a sofa, which she wheeled close to the window, that looked into the garden. He could not, however, play with his companions again that evening.

Robert felt very uncomfortable; he wished to go

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and sit by the side of the little boy, but he did not like to meet Mrs. Collins, who, he supposed, knew exactly how the accident had happened. Frank Collins, and some other boys, kept away from him, for his answer seemed to them so very unfeeling, that they did not wish to play with him. They did not know, that almost immediately after Frank had left the little boy in the house, Robert had sent his brother Edmund to learn how he was, and to tell him how sorry he was for the accident. Robert had now lost all relish for play, and he was glad when the party broke up. He could not tell, by Mrs. Collins' manners, whether she knew of his conduct or not, but he felt very much ashamed when he bade her good-night.

The next day, and for many days afterwards, Robert kept a continued watch over himself, and there was constant good-humour among the brothers and sisters. There were so many occupations in Mr. Wilmot's family, and such a hearty good-will in assisting each other in all their little plans, that their happiness was seldom disturbed except by Robert's unfortunate disposition. About this time, Mrs. Wilmot fell ill, and Robert was so fearful of making any disturbance, and by that means preventing her recovery, that he took particular pains to control himself, when he was otherwise inclined to domineer. At last his mamma became so much

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better, that she was enabled to sit up in her own room, and have the children to spend an hour or two with her by turns. The young people began to consider their mamma almost well, and therefore no longer thought so much of her health as they had done.

One day, after the boys had come from school, they were playing with Ellen, in a room on the same floor as their mother's, but on the other side of the house, when Robert proposed that they should make a large stage-coach with the various boxes that happened to be in this room. The boxes were soon piled together; but Robert insisted that they should be placed exactly as he described, nor would he allow anyone to be seated until he had altered the arrangement several times. Edmund was to be the guard, he the coachman. "Cannot you keep down, when I tell you?" said he to Ellen; "you are not to be passenger yet. I shall call you presently."

Ellen waited patiently a little time; but Robert was so long before he held up his finger and called out, "Going up to London, ma'am?" that she became quite impatient, and was scrambling up the boxes to seat herself.

"Yes, let her ride now," said Edmund; "I am sure she has waited long enough."

"No, she shall not," exclaimed Robert; "she has no business to get up before I beckon to her," and he sprang off his coach-box to pull his sister down.

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Ellen did not like to be treated so roughly, and she struggled to prevent him, seizing hold of one of the boxes, and calling out that he would hurt her. Edmund begged his brother to leave Ellen alone, and asked him what was the use of persisting: "You will be sure to hurt her, Robert," said he, "and then you will be sorry."

Robert took no heed of what either of them said; but resolving to make them follow his wishes, he continued pulling Ellen with all his might. He did not observe that the heavy box, which Ellen grasped so firmly, was moving. In a moment, Robert, Ellen, and the box fell together, and the poor little girl gave a loud shriek. Edmund cried out, "Oh, Robert, the box has fallen on her: what have you done! what have you done?" Robert could not speak for terror. He sprang from the ground to assist his brother in removing the box, and had scarcely done so, when his mother rushed into the room. She placed the little girl on her lap, and attempted to soothe her; but the more she pressed her towards her, the louder Ellen screamed, "My arm! my arm!" It was then seen that the right arm was broken, for it hung by her side quite powerless.

"Run instantly to the doctor's, Edmund," said Mrs. Wilmot, "lose not a moment; and, Robert, help me to place your sister on my bed. I fear I am too weak to carry her by myself."

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Robert obeyed his mother without speaking, while at each fresh movement Ellen moaned with agony. Her mother, still feeble from the effects of her late illness, exerted herself to the utmost. Robert knew that his own wilfulness had occasioned all this pain and distress; no wonder, therefore, that he could not speak.

As soon as the doctor came, Robert slid out of the room. He dreaded the sight of every fresh person. During the time that the arm was being set, the boys remained outside the bedroom door. "Don't speak to me, don't speak to me," said Robert, in a low, hurried tone, to his brother. "You must hate me! everybody will hate me! oh, my poor sister!" and unable to bear the thought of the pain she was suffering, he ran to his own room, and threw himself on the bed in the deepest sorrow. After the arm was set, the little girl fell into a short sleep, but awoke with so much fever, that her mother was greatly alarmed.

As for Robert, he spent the remainder of that day in his own bedroom, or stationed at his mother's door, listening to every sound, and inquiring about his sister from each person that came out of the room. Edmund was ever on the watch to tell him, and to console him.

"Dear Robert," said he, "do not be so very miserable; Ellen may be better soon: you did not

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mean to hurt her ; pray, do not cry so. Poor dear girl, she blames herself quite as much as you."

"And does my mother know all?"

"Yes, she asked me all about it," replied Edmund, "and I was therefore obliged to tell her ; but she said nothing : she only sighed, and the tears came down her cheeks. But I dare say she cried about Ellen."

"Oh, no, no !" said Robert, "she cried at my unkind conduct to Ellen ;" and in fresh grief he left his brother, to hide himself in his own room.

"How can I meet my father?" said he, as the evening approached. "What shall I do? but it is better to bear his displeasure, than to stay here dreading to see him. He cannot blame me more than I blame myself."

The moment he heard his father's knock, he ran down stairs with a kind of desperate courage, and with a voice almost choked with grief he gave his father the whole account of the accident. His father said not a word, but motioning him from him he hastily took up a candle, to seek Mrs. Wilmot and his little girl.

"Oh father, speak to me!" exclaimed Robert; "I am so very wretched: do not turn away. Speak to me dear, dear, father."

"I cannot, Robert. What can I say to you? To blame you now, would be cruel: I can only pity

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your miserable feelings ;” and so saying, Mr. Wilnot went up stairs.

For several days Ellen continued so ill, that neither of the boys was allowed to enter her room, and Robert scarcely knew a happy moment.

At length his earnest desire to see her was complied with ; and from that day till Ellen was allowed to leave her room, Robert could hardly be persuaded to stir from her side. He watched her while she slept, assisted his mother in waiting on her, gave her the choicest of his toys, refused every invitation of his companions to join in their pleasures, and spent all his money in buying picture-books for her. Better even than all this, he showed his sincere sorrow for the pain he had occasioned, by the most earnest endeavours to check the disposition which had led to this calamity. For more than two months after Ellen had left her bed, she wore her arm in a sling, and this sling constantly reminded Robert of the necessity of watching himself. He often felt strongly tempted to domineer ; but he restrained himself, and rather than insist on having his own way, he would frequently bite his lip, and run out of the room. Neither his father nor his mother had ever uttered one word of reproach to him : but now, when they saw his daily exertions to act generously in trifles, they encouraged him by every affectionate expression.

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Two years have passed since Ellen's accident. She has recovered the perfect use of her arm. Robert is not only esteemed for those other qualities which all knew him to possess, but is beloved for his readiness in giving up his own wishes for the gratification of others. Everybody who knows how difficult it is to cure a bad habit, must feel a double respect for the boy who has so completely succeeded.

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UNCLE JOHN IN CANADA.

“UNCLE John is coming to-night, Richard,” cried Oliver, “so make haste and finish your map. You know, he said it must be finished before he could tell us anything about the difficult passage he had across the great river St. Lawrence, in the winter time.”

“My map of that part of Canada which he said he would tell us about is done,” replied Richard. “I am only putting in a few more places beyond the town of Quebec.”

“Let me look,” said Oliver; and he took the map of Canada, in North America, of which his brother had been making an outline. He saw the noble river St. Lawrence, and, on the northern side of it, the town of Quebec. Richard had also marked the width of the river at this place, nearly one mile and a half, and had also marked that the water was not salt, but that the ebb and flow of the tide continued beyond town.

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“This will do capitally. I wish uncle John would come. The sky looks so dark, that I am sure we are going to have a fall of snow.”

At this moment a rap at the door made the boys rush down. They opened the door, and in came uncle John. Oliver hastily took from him his umbrella and great coat, while Richard pulled off his hat and gloves.

“Ha, ha, ha! well-done, my lads!” cried the good-natured uncle, “ha, ha, ha! you are as active as ants.”

“We are so glad you have come,” said the boys. “The map is done, and we want to hear all about the frozen river, and everything else that you promised us.”

Up-stairs they all went. The map was laid before uncle John. He took out his spectacles, wiped them, and placing them on his nose, carefully looked at the map before him.

“Very well, my dears, very well; this is correctly laid down: and therefore, as you have kept your part of the bargain, I will not shirk mine. But let us draw nearer to the fire, for it is a cold night, and my story is a cold one.”

Richard and Oliver stood one on each side of their uncle, and with little Arthur between his knees, uncle John began his account of the serious difficulty he had in crossing the St. Lawrence in the winter time.

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“The adventure, of which I am now going to give you an account, took place many years ago. I had some important business, which called me to Quebec. But when the time for my leaving England arrived, the season was so far advanced, that the navigation of the St. Lawrence was closed. I was obliged therefore to embark for Halifax. I proceeded from that town, through many hardships and dangers, to the south side of the river, opposite to Quebec. I was two months performing the journey from Halifax, short as it is, the quantity of half-melted snow making the roads in many places almost impassable.

“It was the beginning of January when I reached the St. Lawrence; and I was almost fearful, when I arrived there, that I should not be able to get across to Quebec.

“But my business required me to lose no time; no sooner, therefore, had I entered the little posting house which was situated on the banks of the river nearly opposite to Quebec, than I began to inquire about a canoe and boatmen to take me over.

“‘You will hardly be able to cross,’ said the master of the house, ‘for the river is neither frozen enough to bear on foot, nor open enough for a boat. It is in a sad state of confusion, filled with blocks of ice floating about, which the eddy of the tide

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keeps driving against each other with a horrid clash. See, what a sight!

“I turned, and true enough, I saw lumps of ice much bigger than a stage-coach, loaded with passengers and luggage, rolling about, sometimes sinking so as not to be seen, and then rising several yards ahead, twisting round and round, and heaving about with the current.

“After these had passed by, a stream of water was to be seen every here and there, running quite clear. But the river was frozen solidly more than three hundred yards from the shore.”

“How could the ice get into such large lumps?” asked Richard.

“The water does not freeze all at once; and as it freezes, one flake of ice seems to get piled upon another flake of ice, until, jostled together by the tide, the pieces join into a great mass. The noise that these masses of ice make, when they clash together at the complete freezing of the river, is prodigious. In one moment a general jam takes place, and the smaller pieces being driven with great force against the larger, split in all directions, and the sound echoes all around.

“I did not like the appearance of the river at all, and yet I could not delay proceeding to Quebec. I thought I might either be jammed between some of these enormous lumps of ice, or my crazy bark be

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capsized beneath one of the large slabs or flakes that were floating about just under the surface of the water. If I could have waited till the river was quite frozen over, I should have had no trouble to get across. But there is no use in thinking of that. Go at once I must, and therefore I asked the master of the house which would be the best way to get across.

“He tried to persuade me to wait till the next day, to take the chance of the ice being *set*, as he called it. I told him this was impossible. I must cross if I could do so by any means.

“‘To get across now is a difficult job,’ said he; ‘but still, should you be bent upon so doing, it can be managed, if you set off instantly. It is now slack water, and about half-tide, so that is just the right time to make the attempt. At full tide you must not hope, with the river in such a state as it is now, to make the passage without the greatest danger of losing your life.’

“I am ready to depart this instant,” I replied; “where shall I find a boat and boatmen?”

“‘I will send them to you,’ said the man. ‘You must not have a boat, but a log canoe; and then, with some Canadian boatmen, I’ll answer for your safe landing at Quebec in about an hour or two.’

“I begged him to lose no time, and away he went to find a canoe and the men. In a short time he

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returned with the news that everything was ready to receive me, and I went down to the river side.

“There I found five Canadians, each with an axe stuck in his sash, and a paddle in his hand, and the log canoe.”

“What is a log canoe?” asked Arthur.

“A log canoe is nothing more than about fifteen feet of an entire tree, rounded at both ends alike, and hollowed out in the middle. At the head, and at the stern were fixed two pieces of rope, each nearly eight feet long. The men were holding the rope at head of the canoe, and directly I joined them, they began to drag the canoe from the shore along the ice, as far as it was solid enough to bear their weight. The last few feet being rather unsound they chopped it away with their axes, and so brought the head of the canoe close to the water.

“The tide being nearly at its ebb, was not just then very rapid; and this was lucky, for I did not much like the prospect of launching the little awkward vessel into water so troubled, and with the ice in such continual and violent motion. The boatmen were quarrelling, and kept up an unceasing chattering as to the best manner of launching. This did not afford me much encouragement.

“They bade me get into the canoe, and sit down at the bottom, midships, and so be ready for the launch. I sat down, and fixed myself as tight as I could.

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Just as we were going off a large flake of ice made its appearance. Had we been near it, our canoe must have upset. So we waited till it had passed.

“After this had floated by, we saw a channel of clear water, for about a hundred yards. This was the time to seize, and the boatmen giving the signal for moving, by bawling out ‘Keep steady, sit still, hold fast,’ in an instant began pushing the canoe off the ice. She came plump into the water with a splash, and a shock that I shall never forget.”

“Very lucky you did not fall out,” said Oliver, “you would have had a rare cold dip if you had, uncle John.”

“Ay, my lad, there you are right: but let me tell you I found it difficult to keep my place. The fall from the ice into the water was a fall of two feet, and it made the canoe pitch not a little.”

“Two feet from the ice to the water!” exclaimed Richard, “Why, how can that be?”

“You know, uncle,” said Oliver, “that the ice, which is only water frozen, could not be higher than the water which is not frozen.”

“I begin to think that your wits must be frozen in spite of this delightful fire,” replied their uncle; “cannot you understand that, while the water falls with the tide, such part of the ice as forms a complete mass, and sticks to the shore, continues always of the same height?”

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“ Ah!” said Richard, “ and it was low water when you crossed. I wonder I did not think of that.”

“ Go on, uncle,” said Arthur.

“ No sooner,” continued their uncle, “ was the canoe on the water, than every one of the fellows leaped in, each in his place, and began paddling with the most eager haste to avoid an enormous piece of ice that was bearing down hard upon us.

“ Everything now depended upon their activity; for no progress was to be made, except by their seizing in a moment the opportunity which presented itself.”

“ What did you do all this time, uncle John?” said Arthur.

“ Sat as quietly as I could, midships, in the canoe, and contrived not to be pitched out of her, during the various contrary motions that she received, by the haste and bustling activity of the boatmen. When the men found that they could not pass this piece of ice, they got alongside of it, and with a quickness that astonished me, they all at once jumped out of the canoe upon it, seized the rope which was fastened to the head of the canoe, and drew her by main force out of the water upon it. Then, three on one side and three on the other, they pushed her along, running more than one hundred and fifty yards across, till they saw the clear water again.

“ With a shout of ‘ Sit steady!’ they made the

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second launch, and unluckily we were this time splashed all over. The water froze hard instantly on my clothes. I had no time to shake myself to get rid of any of the icicles, for a great quantity of ice that we had not seen, and which seemed to have just risen up from the bottom of the river, came bearing down upon us in so alarming a manner, that I expected every moment we should be sunk by it.

“The men paddled, strained, and blamed one another for not having kept a better look-out. But all would not do. On, on came the ice: there was no escape for us, and we were hemmed in, and jammed on both sides by a soft pulpy mass, which carried us along with it down the current, considerably below the point we were trying to reach. With all our efforts, we were as helpless as infants.

“I asked what was to be done now. But, without giving me any answer, out the hardy fellows jumped into this freezing mass, and sank above their knees and sometimes even to their hips in the water, trying to drag the canoe forward by the rope.”

“Oh, uncle!” cried Richard, “I never heard of such a thing in all my life! What could they stand upon, when the ice was not hard?”

“What I tell you, master Richard, is a fact,” replied his uncle, “I saw it with my own eyes, and this is the way in which the men contrive it. The

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river was full of moving ice, as I have told you, and although the surface of it was unsound in some places, yet there were large slabs of ice floating underneath, upon which they rested after sinking through the unsound part. I never saw such men; they were not to be conquered. They kept on pulling and hauling, and every now and then cutting away with their axes such blocks of ice as they could neither pass nor get over. They ordered me to keep rocking and shaking the canoe, that she might not freeze on the ice; until having got through all the obstacles, we were once more free of the ice and in a channel of clear water."

"If the canoe had frozen on the ice, uncle John, what would you all have done?" asked Oliver.

"I cannot say; our situation would have been very unpleasant. We most probably should have been frozen, for the day was intensely cold, and we must have floated on with the ice, without any chance of assistance."

"But you kept the canoe well rocked about, did you not?" said Oliver. "If I had been with you, I could have done that nicely."

"You think so by this warm snug fire," replied uncle John; "but let me tell you, you would not have found it such an easy job upon that freezing river, with your clothes all stiff with ice, and your hands and body benumbed with the cold. Strong as I

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am, if the men had not helped me, we should have stuck fast.

“So on we went for a few minutes in clear water. But not long did we enjoy this way of proceeding, for soon again we were inclosed in half-frozen heaps of melted snow, and then were rapidly driven over sheets of ice. The boatmen did not lose a single moment of time. They either pulled the canoe on by the rope, themselves wading in the water, or they pushed her over the ice. Every ridge of ice that they could not pass, they hewed down with their axes. They were in the canoe, and out of the canoe, now paddling, now dragging, now cutting, now pushing with the boat-hook, now hauling with the rope, just as these different ways for our getting on were wanted.”

“How glad they must have been when they reached the opposite shore,” said Richard.

“Yes,” replied his uncle, “for it took us more than an hour to cross. When we arrived at Quebec, I was so stiff with the cold that I could hardly stand; and besides that, I had a complete coating of ice encrusted hard upon me, from the splashing of the water.”

“The poor boatmen must have been in a worse plight,” said Richard.

“So they were, but they were very hardy fellows, and were also accustomed to the work, and to the

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severity of the cold, and therefore they did not mind. They pocketed with much glee the passage-money I had engaged to give them, to which I added a little more, as a reward for their skill and perseverance."

"Did you soon get warmed at a comfortable fire?" asked Arthur.

"No, my little man, I had to climb, or rather crawl, slowly up the narrow, steep, and dirty street, which leads from the lower part to the upper part of the town, where the house was situated to which I was going. I was extremely grateful to get into a room well warmed by a stove, and so recover the use of my limbs."

"Do people go upon the river when it is quite frozen over?" said Oliver.

"Yes; and they drive upon the ice in carriages. Heavy waggons also cross over. As soon as the ice is reckoned secure, a road is broken as smooth and as straight as the inequality of the heaps of ice will permit. The whole surface of the river is covered with little hills of ice, some of which the people chop through, and in those places where the ice is too hard to be moved the road is made to wind."

Just then the door opened and the tea-things were brought in. All the boys exclaimed that they were sorry.

"So am not I," said uncle John, "I shall be

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obliged to your mother for a cup of warm tea before I go out in the snow ; for boys, I must now say good-bye, as I have a person waiting to see me at home."

"When will you come again, dear uncle," said Oliver, "and tell us something more of the many curious things you have seen in your travels?"

"The first leisure afternoon that I have I will be with you ; so fetch me my hat and the rest of my tackle, and shake hands. Good-bye to ye all.

SIR HUMPHRY DAVY.*

Who is there who has not read or heard of Sir Humphry Davy? Where is the person, young or old, who, knowing anything of his discoveries and inventions, does not feel some curiosity to be made acquainted with a few particulars of his early life?

When we hear for the first time of any useful invention, such as the steam-engine; or of some striking and important discovery, such as that of the New World; or of some great work of improvement, such as what occurred in Russia rather more than a hundred years ago: is it not one of our earliest endeavours to gain some account of the distinguished man by whose exertions the work which so deservedly fixes the attention of mankind has been performed?

We owe to Sir Humphry Davy many useful discoveries and inventions, some of which it requires

* This memoir has been chiefly taken from the two interesting biographies by Dr. Paris and by the philosopher's brother, Dr. John Davy.

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great knowledge to be able to value as they deserve. But there is one among them, the safety-lamp, the value of which is intelligible to everybody; and for this reason his name has been particularly connected with it. Supposing Davy to have done no other service to mankind, the safety-lamp alone would be sufficient to cause his name to be universally revered, and to make the particulars of his life a subject of interest and inquiry.

Sir Humphry Davy was born at Penzance, in Cornwall, on the 17th of December, 1778. Nothing very remarkable is related of him as a child. He was quick and industrious, and had a great fondness for reading. Several instances have been mentioned of his ingenuity as a boy. He made fire-works. He formed a collection of rare birds, which he stuffed with extraordinary skill. And fishing and shooting, in both of which he excelled, were his favourite recreations. He was fond of drawing flowers, rocks, and landscapes, or anything that struck him as curious and beautiful. In 1794 he lost his father, and in the following year he was apprenticed by his mother to Mr. Borlase, a surgeon and apothecary, at Penzance.

Here it was that he commenced the study of chemistry, which he afterwards pursued with such ardour and success.

To study chemistry is to study what effects will

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be produced by mixing or putting together different substances, or by separating them from one another. By chemistry we learn how to bleach cloth to the purest white, or to cover it with the gayest colours—to make the useful earthenware and elegant china from a lump of clay—to manufacture soap by mixing together grease and pearlsh— to convert the disgusting skin of a dead animal into useful leather—and to prepare medicines capable of restoring the sick to health and happiness. By chemistry we are able to separate from a shapeless stone the brilliant gold, and the useful iron—to extract from coal the gas which produces the dazzling light that illuminates all our great towns—to obtain from water the elastic steam which gives motion to the resistless engine, driving thousands of wheels in a cotton-mill, a train of carriages on a railroad, and the vessel, with its enterprising crew, across the tempestuous ocean against wind and current. By chemistry we also learn how to apply manures to the improvement of the land, and so to increase the quantity and improve the quality of our crops. It thus appears that our food and clothing, our cleanliness and health, and our comforts of every description, are all improved by chemistry.

The profession of surgeon and apothecary does not appear to have suited Davy's taste; but the investigation of the properties of all kinds of bodies

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with which he was acquainted, and the search after new bodies—these were his fondest occupations. It was fortunate for Davy that the scenery and productions of his native county were well calculated to raise his curiosity and excite his desire for knowledge. The surrounding mines of copper and tin abounding in a great variety of splendid and extraordinary minerals, worked to vast depths by means of the power of water and of steam; the adjoining cliffs and headlands, the tempestuous ocean, even the weeds thrown up by waves on the sea-shore, or vegetating in the pools of salt water; afforded matter for interesting inquiries and constant observation.

An accident which happened to him about this time, and which, but for his promptitude and courage, might have deprived him of life, is deserving of mention. He was bitten by a dog, supposed to be mad—and without a moment's hesitation, he cut out the wounded part on the spot, with his pocket-knife; and then proceeding at once to the surgery, he cauterized the wound, that is, he burnt it with caustic. He suffered so much from this painful operation, that he was confined to the house for three weeks.

His labours as a chemist were long carried on without the assistance of any instruments, except those of the rudest description, or such as he could contrive for himself. Among others that he was

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obliged to put up with, were his master's phials and gallipots, and the pots and pans used in the kitchen. The wreck of a French vessel near the Land's End at last came to his assistance. From this wreck the surgeon escaped, and found his way to Penzance. By accident he became acquainted with young Davy, who did many little acts of kindness towards him; and in return the grateful surgeon presented the friend whom he had thus found in his distress, with a box of instruments, which he had been so fortunate as to save from the ship.

Davy made about this time the acquaintance, and quickly obtained the friendship, of Mr. Gregory Watt, a young man rather older than himself, of great attainments and of ardent zeal in the pursuit of knowledge. They met daily and explored the objects most worthy of notice together, generally returning from their walks with their pockets laden with specimens of rocks and minerals. One of their favourite places of resort was the Wherry mine, the shaft of which was in the sea, approached by a long wooden bridge, and the workings of which were entirely under the sea. That wonderful invention the steam engine, which only a short time before had been perfected by Mr. Watt, the father of Davy's friend, was erected on the shore, and drew up water from far beneath the bed of the sea.

This intimacy with the son of the great inventor,

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with one who could give him so many details of patient research crowned with such striking success, must have quickened Davy's desire for the attainment of knowledge, and for the power to make that knowledge useful to others as well as to himself. In fact, in one of his note-books that he kept about this time, we find these words:—

“I have neither riches, nor power, nor birth to recommend me; yet, if I live, I trust I shall not be of less service to mankind and to my friends than if I had been born to these advantages.”

We shall see that he kept this noble object before him through life.

But if Davy assiduously strove to increase his knowledge of all surrounding objects, no less faithfully did he perform his duties as assistant to Mr. Borlase; for he gained the good opinion of that gentleman equally by his zeal in studying his profession and by his kindness and humanity to the patients, particularly to those of the poorer class.

The next great help which Davy received in his pursuits, was through Mr. Davies Gilbert, who was not only a learned and clever man himself, but, what is deserving of much greater praise, was always ready to assist others in their endeavours to obtain information. One day, as Mr. Gilbert was walking with a friend, he saw young Davy leaning over the gate of Mr. Borlase's house. Mr. Gilbert was struck

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with his appearance, and when his friend observed to him that the lad whom they were looking at was fond of making chemical experiments: "Chemical experiments!" exclaimed Mr. Gilbert, with much surprise, "then I must have some conversation with him." Mr. Gilbert soon convinced himself that Davy was really deserving of all the assistance that he could afford him.

What encouragement for young Davy in the midst of all his difficulties! what a reward for all his past exertions!

Mr. Gilbert invited him to his house, and gave him the use of his library. During one of young Davy's visits, Mr. Gilbert took him to see the Copper Works at Hayle. Here for the first time Davy saw a quantity of chemical apparatus, hitherto unknown to him, except by drawings. An air pump, which was a part of it, particularly fixed his attention. He worked the piston, exhausted the receiver, and opened the valves with the simplicity and joy of a child engaged in the examination of a new and favourite toy.

Soon after this Davy entered into a correspondence with Dr. Beddoes on the subject of light and heat which led to Dr. Beddoes offering him the situation of superintendent of a scientific institution in Bristol, where he was to assist the doctor in conducting various experiments. This offer Davy gladly ac-

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cepted, having been enabled to do so by the kindness of Mr. Borlase, who released him (to use his own words, written at the back of the indenture of apprenticeship) "from all engagements whatever, on account of his excellent behaviour;" adding "because, being a youth of great promise, I would not obstruct his present pursuits, which are likely to promote his fortune and his fame."

On the 2nd of October, 1798, Davy quitted Penzance for Bristol. From this time till February, 1801, he was actively employed in extending his knowledge, and superintending experiments. He also made many useful discoveries, which he published, so that all who chose might have the benefit of them. His name now became so generally known among men of science, that when, about this time, a vacancy occurred at the Royal Institution, he was appointed Assistant Lecturer on Chemistry. In consequence of this honourable appointment, he came to reside at the Royal Institution, Albemarle-street. In the performance of his new duties, he gave such general satisfaction, that on the 1st of June of the same year, he was appointed Lecturer of Chemistry, instead of Assistant Lecturer; and on the 31st of May, 1802, he was made Professor of Chemistry.

As Davy was poor, and had nothing to depend upon for his support, beyond what he earned for himself, this appointment, by securing to him a

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certain though moderate income for the future, and so relieving him from all anxiety concerning his maintenance, enabled him to devote the whole of his time to his favourite pursuits. But the appointment was still more welcome on another account. It gave him constant access to the chemical apparatus of the Royal Institution, considered to be the most complete and powerful in the world.

His lectures, during a long course of years, show that this advantage was not thrown away upon him; so grand and so frequent were the discoveries which he announced, and the experiments which he performed in the presence of his admiring audience. His first splendid discovery was, that the substances called "alkalies," such as potash, or pearlash, soda, &c., are not simple substances, as they had always been considered; but are composed of *metals*, combined with oxygen gas. These metals, or *metallic bases* of the alkalies, he named potassium, sodium, &c. Now oxygen forms a part of water, and potassium and sodium, or the *metallic bases* of the alkalies, combine so rapidly with oxygen gas, that a piece of potassium, not bigger than a pin's head, when put into water, will instantly burst into flame.

The extreme delight which Davy felt, when he first saw the metallic base of potash can only be conceived by those who are familiar with the laborious operations of the laboratory, and the exciting nature

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of original research ; and who can appreciate the workings of a young mind, with an avidity for knowledge and glory. It is stated that when he beheld the minute globules of potassium burst through the crust of potash, and take fire as they entered the atmosphere, he could not contain his joy ; he bounded about the room in extatic delight ; and some little time was required for him to compose himself sufficiently to continue the experiment.

Davy's labours and excitement, however, were the prelude to a severe attack of illness, which was very near proving fatal ; and his great apprehension was, that he should die before he had published his discoveries : in consequence of which dread, he applied himself the more unremittingly to the task of recording them.

The destruction caused by the eruptions of volcanoes is well known to everybody. What it is that produces these dreadful eruptions had not yet been discovered. But Davy, by his experiments and researches, was able to trace out and explain those wonderful operations, hidden and silent though they be in the bowels of the earth. The following account has been given by one who was present at the lecture, in which Sir Humphry Davy explained the causes of volcanic eruptions :

“ A mountain had been modelled in clay, and a quantity of the metallic bases introduced into its

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interior ; on water being poured upon it, the metals were soon thrown into violent action—successive explosions followed—red-hot lava was seen flowing down its sides from a crater in miniature—mimic lightnings played around ; and in the instant of dramatic illusion, the tumultuous applause and continued cheering of the audience might almost have been regarded as the shouts of the alarmed fugitives of Herculaneum or Pompeii.”

Among other services for which we are indebted to Davy, is his assisting to bring into notice Dr. Faraday, one of the most distinguished chemists of the present day. Young Faraday was a bookseller's apprentice, fond of experiment, and averse to trade. He attended some of Davy's lectures, took notes, and afterwards wrote them out fairly. Wishing to devote himself to those pursuits for which he felt a relish, he applied to Sir Humphry Davy, and sent to him the notes of his lectures that he had written out. Sir Humphry Davy seeing the merit of Faraday's performance, and desirous of rewarding talent and industry, succeeded in obtaining for him a situation at the Institution. There he has ever since continued to rise, in public esteem and reputation, doing credit to the fame of his great master and to his own distinguished abilities.

Having by marriage become possessed of a large property, Sir Humphry Davy, on the 9th April, 1812,

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read his farewell lecture at the Institution ; and from this time his duties as a lecturer ceased. It was not with a view to idleness that he did this, but rather with the desire of making himself more useful by a different employment of his time. In a letter to a friend during the August of this year, he writes, "having given up lecturing, I shall be able to devote my whole time to the pursuit of discovery."

The next thing that we find him actively engaged in is an improvement in the manufacture of gunpowder. One object he had in view, in this instance, was to serve a friend. But as Sir Humphry's name was used in connection with the new manufacture in order to give it celebrity, a report soon spread abroad that he was desirous of making money by his improvement. He loved science for itself, and this report pained him exceedingly. "I have," he writes to a friend, on hearing it, "resolved to make no profit by any thing connected with science. I devote my life to the public in future ; and I must have it clearly understood, that I have no views of profit in anything I do."

Sir Humphry Davy, having now abundance of leisure and an ample fortune, was desirous of crossing over to France, for the purpose, among other things, of inspecting the extinct volcanoes in Auvergne, and of then proceeding to examine those of Naples. There was, however, a difficulty in the way of his gratifi-

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cation, for England and France were at war with one another, and the Emperor Napoleon, who ruled in France, would allow no Englishman to travel in his dominions. But to show how much learning and really useful exertions are respected, even by an enemy, no sooner did Sir Humphry apply to the Emperor for the desired permission, than Napoleon granted to the distinguished chemist what he had denied to the richest and most powerful men in the country.

Davy set off on his journey in October, 1813, meeting everywhere, as he proceeded, with the most friendly and respectful attentions. His stay on the continent was considerable, for he did not return to London till April, 1815. In the course of his travels he visited Mount Vesuvius, and interested himself in the excavations going on at Pompeii.

Shortly after his return, he was solicited to direct his attention to the subject of fire-damp in coal mines, with a view to discover some contrivance by which the miners might be protected from its fatal effects. He complied with this request. He examined, he reflected, he contrived; and then he examined, reflected, and contrived again. His efforts were not in vain. With a speed and a success, almost beyond conception, he furnished the protection required. This protection is the safety-lamp.

To understand the merit of Sir Humphry Davy's

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performance, it is necessary to know something of the structure and magnitude of a coal-mine, as well as of the nature of this destructive fire-damp. Some of these mines extend several miles, and some of them have been worked to a depth of more than five hundred feet. These large mines have seldom more than two or three shafts, or communications with the surface of the earth. The difficulty of ventilating them, or supplying a sufficiency of fresh air, will at once be perceived. Nevertheless, by means of ingenious machinery, this difficulty had been pretty well got over. But there still remained the fire-damp, against which no ingenuity had been able to protect the miners. The fire-damp is a kind of gas, very much like what is burnt every night in the gas-lamps in the streets. When first exposed to the air, newly dug coal always parts with a portion of this gas; but on some occasions, the pitmen have opened crevices in the bed of coal, from which it has poured out quite in a current; and such currents have been known to continue for months and years. These currents the pitmen call "blowers."

Everybody has seen a gas-lamp lighted. The gas kindles the moment the lighted torch is brought in contact with it. The same happens with the fire-damp. And here is the danger; for the pitmen cannot work under ground without candles or lanterns. On the approach of a candle or lantern, the

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fire-damp is kindled; and, expanding with the heat, it drives before it a roaring whirlwind of flaming air, which tears up everything in its progress, scorching some of the miners to a cinder, and burying others under enormous ruins shaken from the roofs. Then thundering to the shafts, it converts the mine, as it were, into an enormous piece of artillery; and wastes its fury in a discharge of thick clouds of coal-dust, stones and timber, together with the limbs and mangled bodies of men and horses.

But the first effect of one of these subterranean combustions, appalling though it be, is not the worst. All the contrivances for ventilating the mine being destroyed in the general ruin, and the fresh air being altogether excluded from the innermost parts of the mine where the work is proceeding, such of the miners as may have survived the explosion, are doomed to the more painful and lingering death of suffocation from the after-damp, or *stythe*, as it is called.

An account of one such accident, as it really happened, will place before the reader still more vividly the terrible nature of these explosions. The following occurred at Felling Colliery, near Sunderland, on the 25th May, 1812. This mine was considered by the workmen as a model of perfection, both with regard to the purity of its air, and the arrangements of its machinery. The concern was in

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the highest degree prosperous; and no accident, except a trifling explosion which slightly scorched two or three pitmen, had ever happened.

Two *shifts* or sets of men were constantly employed, the first of which entered the mine at four o'clock in the morning, and were relieved at their working posts by the next set at eleven; though the second shift of men were often at their posts before the first set had left, as was the case on the present unhappy occasion.

About half-past eleven in the morning of the 25th of May, the neighbouring villages were alarmed by a tremendous explosion. The subterraneous fire broke forth with two heavy discharges from the shaft called the "John Pit," which was 102 fathoms deep, and these discharges were almost immediately followed by one from the "William Pit." A slight trembling, as if from an earthquake, was felt for about half a mile around; and the noise of the explosion was heard, though dull, at the distance of three or four miles.

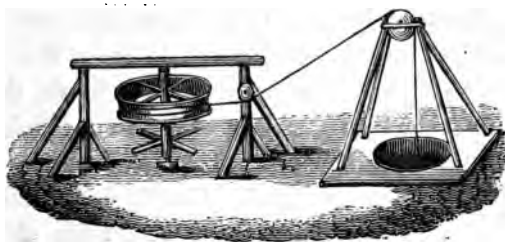
Immense quantities of dust and small coal accompanied these blasts. The heaviest part of the ignited matter, such as masses of timber and fragments of coal, fell near the pit; but the dust borne away by a strong west wind fell in a continued shower to the distance of a mile and a half.

As soon as the explosion had been heard, the

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wives and children of the pitmen rushed to the shaft. Wildness and terror were seen in every countenance. The crowd thickened, and in a very short period several hundred persons had collected together; and the air resounded with exclamations of despair for the fate of husbands, parents, and children.

The machinery by which the men were usually brought up and let down having been rendered useless by the eruption, the rope of the *gin* was sent



down the shaft with all possible expedition. In the absence of horses, a number of men who seemed to acquire strength as the necessity for it increased, applied their shoulders to the *starts* or shafts of the gin, and worked it with extraordinary speed.

One hundred and twenty-one persons were in the mine when the explosion took place; and by twelve o'clock, thirty-two, all that survived this dreadful catastrophe, had been brought up to daylight; and of these, three boys lived for only a few hours.

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Twenty-nine persons, then, were all who were left to relate what they had observed of the appearances and effect of the explosion.

The men that remained in the mine were not given up for lost, until great efforts had been made to save them. Nine brave men were found willing to venture their lives in this dangerous service. They descended the "John Pit," but their advance was soon prevented by the *choke-damp*, and they were obliged to return.

Undismayed by the perils these nine men had encountered, two others offered to enter the mine once more, but they were driven back by the flames in which the place was by this time enveloped, and all further attempts to rescue the poor miners were necessarily abandoned. By this single accident forty women became widows, and more than a hundred children orphans.

It was to prevent, if possible, the recurrence of such calamities as this, that Sir Humphry Davy applied his powerful mind. He set to work without delay. The first application was made to him in the beginning of August, 1815, and at the latter end of that month we already find him visiting the mines of Newcastle, to make himself acquainted with every particular concerning the fire-damp. Before the end of that year he had invented his famous safety-lamp.

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He first discovered, in the course of his experiments, that explosions of gas or fire-damp, would not pass or communicate through long tubes, if the bore or diameter of them were sufficiently small. He then proceeded in his experiments by diminishing the length, and also the diameter of his tubes, till he found that very short tubes would do equally well, provided the diameters of them were small in proportion. Last of all, he found that fine wire-gauze, which in its nature may be said to be a number of very short and very narrow tubes joined together, would afford the same security. He constructed a lamp, therefore, entirely surrounded by this fine wire-gauze, in such a manner that the only communication between the light of the lamp or candle inside, and the external air, was through this wire-gauze.

It is well known that no lamp or candle will burn unless the flame be supplied with air—the lamps used in our houses, and the gas lamps in the streets, all being so constructed as to allow the flame to communicate freely with the air from outside. If, indeed, lamps could be made to burn, from which the external air is excluded, there would have been no difficulty in preventing explosion, for air-tight lanterns could easily have been made. But as the air must be admitted to the flame, the opening made to admit it unfortunately admits also the gas or fire-damp.

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When there is no accumulation of gas or fire-damp in the mine, the flame in the safety-lamp is fed like that of any other lamp, by the air outside, which enters through the wire gauze; the openings between the wires being sufficient for that purpose. And when there is an accumulation of fire-damp in the mine, the gas also enters with the ordinary air (with which it is mixed), and catches fire, making a beautiful mass of light inside; but, although the air and gas can pass through the gauze, the *flame* cannot, so that the gas or fire-damp outside cannot explode.

The wire-gauze lamps have ever since been extensively used in the mines, and have been fully proved to answer all the purposes for which they were intended. Among the miners they are called "Davy's;" and such is the confidence of the pit-men, that with one of these lamps they will enter into the most explosive atmosphere, and go into the most remote corners, without the least dread of their old enemy, the fire-damp.

Nor is the use of the safety-lamp confined to this country or to mines. It has been extensively adopted abroad; and is used by prudent people in gas manufactories, spirit warehouses, and chemical laboratories. In fact it ought to be used wherever there is the least danger of an explosive atmosphere.

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But unfortunately there are many ignorant and rash men, who, having but an imperfect knowledge of the risks they are running, and disliking even a little trouble, often persist in working in mines and other dangerous places with an ordinary candle; or who, if they have a Davy lamp, will not hesitate when the lamp burns dim—though its doing so is itself frequently an indication of danger—to open the door of the lamp, and sometimes even to take out the candle. This is the chief cause of the fearful explosions in mines, which still from time to time take place.

In speaking of the safety-lamp, it is right to mention the efforts of another great man, who was working at the same time as Sir Humphry Davy, and with the same object, though neither of them knew of the other's proceedings. I refer to Mr. George Stephenson, the renowned inventor of the locomotive steam-engine, and the first person who rendered railways available for travelling. He, like Davy, had been induced by motives of humanity to try to make a lamp which might be used in mines without danger; and he succeeded, though his lamp, not being so convenient as Sir Humphry's, never came into such general use.

It would not be doing justice to Davy, if we were to confine ourselves to the notice of his worth as a man of industry, observation, and skill. He has

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still higher claims than these, great as they are, to our respect and admiration. By the safety-lamp he might have made, had he chosen, a large sum of money; but, acting on the principle with which he had started in life, he declined to make money by this discovery. He gave the full advantage of his safety-lamp to the miners, and owners of the mines, and he received from them warm and repeated expressions of thanks. To such a man as Davy the grateful thanks of his fellow-creatures was quite a sufficient reward for all his labour and anxiety. But even this reward, flattering as it must be to everybody, was scarcely required by him, so great was his fondness for experiment and discovery.

In actions and pursuits such as these, Sir Humphry passed the remainder of his life. At different times he visited Norway, Sweden, Denmark, and Germany; and he likewise again explored Vesuvius and the remains of Herculaneum. On the 30th of November, 1828, he was elected President of the Royal Society, in the place of Sir Joseph Banks, who had died shortly before.

The last few years of his existence were saddened by ill-health. This is a calamity to which all are liable. But in his ample store of information, in the habit of observation, in the love of experiment, in his fondness for rational conversation and correspon-

SIR HUMPHRY DAVY.

dence with his friends, he found wherewithal to charm the hours of restlessness and suffering. It is needless to mention that a man so formed to be loved and admired, was attended throughout his illness with the most anxious affection ; Dr. John Davy, to whom, to use his own grateful words, Sir Humphry had been "a father, a brother, a most kind friend and teacher," was with him, sympathising with his scientific tastes, correcting his last work with him for publication, and alleviating his sufferings by all that ingenuity could devise.

When the great philosopher felt his end approaching, he sent for his brother, to whom he said, "I am dying ; and when it is all over, I desire that no disturbance of any kind may be made in the house ; lock the door, and let everyone retire to his apartment." He expired at a quarter past three in the morning without a struggle.

Thus died Sir Humphry Davy at Geneva on the 28th of May, 1829, in the 51st year of his age.

In the early part of the memoir we saw what were Davy's wishes and aims as a youth. In 1821, when at the height of his fame, as President of the Royal Society, honoured all over Europe as foremost in the ranks of science, he thus wrote in his journal : " May every year make me better, more useful, less selfish, and more devoted to the cause of humanity and science ;" and a few weeks before his death, while

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suffering from his mortal disorder, he inserted these words in a note-book he then kept, "If I die, I hope that I shall have done my duty, and that my life has not been vain and useless."

Is it not well to know how this great and good man succeeded in gaining the object which he cherished from youth till death?

There is a letter from him to his younger brother (then approaching manhood), which seems to give the very information we seek; for the course he recommended to his brother (and with what happy result all who know the present distinguished physician and philanthropist, Dr. Davy, must know), he steadfastly pursued himself:

"My dear John, let no difficulties alarm you. You may be what you please. Trust me, I know what your powers are. Preserve the dignity of your mind and the purity of your moral conduct. You set sail with a fair wind on the ocean of life. You have great talents, good feelings, and unbroken and uncorrupted spirit. Move straight forward on to moral and intellectual excellence. . . . Live in such a way that you can always say, the whole world may know what I am doing."

THE GOAT IN THE WELL.

ONE fine evening, after a hot summer's day, a goat left his shed, where he had been put up for the night. He wished to take a walk, and enjoy the delicious coolness after sun-set. The moon was shining bright, and the sky had not a cloud over it. The goat rambled through several fields, leaping over the hedges and ditches with great pleasure, until he came into a farm-yard.

In the middle of this farm-yard was a well. The lid of it was off. The goat came close up to the edge of the well, and looked down. He saw something round and bright in the water at the bottom. It was the reflection of the moon that was shining in the sky. But this the goat did not know.

“What a curious round bright thing that is at the bottom of this hole,” thought he. “What can it be? I should like much to know what it is.” So he walked round the edge of the well, trying to discover which would be the best way to get down the hole, and so reach the wonder.

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At one side of the well stood the bucket that was used for the purpose of drawing up the water.

The goat was charmed. He thought this bucket would make a fine carriage, and he pushed it off the ground. He saw the rope by which it was held begin to unwind, and the bucket itself begin to go down. "Ah!" thought he, "this is just the thing. I will jump in and go down, and satisfy myself as to what that bright thing is."

Silly goat! in his eagerness to gratify his curiosity, he never thought of the way in which, when once down, he should get up again. So in he sprang, and down, down, down, went the bucket, and then splash it went into the cold water.

The sudden dash into the water quite frightened him. The bucket was in a moment half full of water and the goat found himself wet and cold.

He began to "na-an, na-an" piteously. The bright round thing that he had come after was gone; and all that he had got as a reward for his curiosity was a seat in a narrow bucket half-filled with cold water. He looked up. There shone the full clear moon. At first he thought that the bright round thing had moved. But afterwards he began to grow rather wiser. At last he felt quite sure that what he saw in the sky was the moon, and that it was the reflection of the moon that he had seen in the water of the well.

THE GOAT IN THE WELL.

What could he do? He could not get the bucket up again. He was cold, and wet and hungry. Bitterly did he repent his imprudent curiosity. He could only bleat "na-an, na-an," as loud as he could.

Presently a cow which was in the farm-yard, hearing such a continued noise, came to the side of the well and looked down. She saw at the bottom of the well a pair of large horns, two bright eyes, and a long beard hanging from beneath a chin.

"Na-an, na-an," bleated the unhappy goat.

"Moo, moo," lowed the cow, and then she walked away.

Next came the cock to see what was the matter. He, too, could only see the horns, and eyes, and beard just above the bucket. He looked a minute, and then, with a loud "cock-a-doodle-do," strutted off.

Poor goat! he was quite in despair, when he saw a sheep peeping down at him. She answered his bleating by a loud "baa." But the sheep could no more help the goat than the cock or the cow could; so she walked away also.

The goat was a long time down in the well; and was visited by a horse, a pig, and a donkey. They could only neigh, grunt, and bray: none could help him.

The noise in the farm-yard at last aroused the

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house-dog, who shaking himself up from the straw he was sleeping on, ran to the well. He looked down, and saw the two horns, the bright eyes, and the long beard: and he heard the sad "na-an, na-an," of the miserable goat. He barked "bow-wow, bow-wow," and away he went full speed to the kitchen of the farm-house, where his master was seated eating his supper. He barked loud, and pulled his master's coat with his teeth.

"Down, Spring, down!" cried the man.

"Bow-wow-wow," barked the dog tugging at his master's coat harder than ever.

"What is the matter, old fellow?" said his master.

Spring whined, ran to the door, came back, pulled the coat, and plainly made his master understand that he wanted him to go out into the farm-yard for something.

"There must be something the matter," said the man, "to make this dog so uneasy. I will go and see."

So up he rose, and the dog showed his pleasure by jumping and barking. He followed the dog, who led him straight to the well.

The man looked down, and saw the horns, the eyes, and beard of the goat. "What brought you here, you silly goat?" said he, taking hold of the handle of the windlass, and beginning to wind up the bucket. Round, round, round went the rope, till the bucket

THE GOAT IN THE WELL.

came up to the top, and out leaped the shivering goat. Away he ran as fast as his legs could carry him, never again to venture into a well. Indeed, it is to be hoped that, after so much fright and danger, he never would venture into any place until he was certain that he should be able to find his way out again.

The man praised the dog, and patted him, and gave him a bone for his trouble. The dog returned quite happy to his kennel.

CHAT IN THE PLAY-ROOM.

"You must not go down stairs," said Arthur Campbell to his sister Emily, who was running out of the play-room; "mamma and papa are busy with some friends, and papa sent me out of the parlour."

"Is aunt Lucy busy too?" asked Emily; "I am tired of being here and playing with baby; let us go to aunt Lucy."

"No, we need not go to her," answered Arthur; "for aunt Lucy said she would soon come to us."

"I am glad of that," said Emily; "aunt Lucy always tells us something entertaining, and we will ask her to drink tea with us here, Arthur. I know she will let me pour out the tea, and I like making tea very much."

"Oh, here is aunt Lucy," said Arthur; "Now, nurse, pray, keep baby away, for we want to have aunt Lucy all to ourselves."

"Poor baby," said nurse, "may not she have one little play with your aunt? look how pleased she is to see aunt Lucy; how she jumps in my arms

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and laughs. You should like baby to have pleasure as well as yourself, Arthur."

"So I do nurse, for she is my own dear little sister," said Arthur; "but only I am so much afraid papa will call aunt Lucy, and then we shall lose her. Pray, aunt, do not play very long with baby. We will place the chairs ready for you round the fire."

"And the stool for your feet, aunt," said Emily.

"Thank you, my dears, I am now quite ready."

"I should like to sit next to aunt Lucy," said Emily.

"No, I must sit next to her," exclaimed Arthur; "may I not sit next to you, aunt?"

"My dears, I can sit between you, and then you will both be next to me," said their aunt. "What shall I amuse you with?"

Emily said she should wish her aunt to read "Frank, or the Cherry Orchard," to them; but Arthur wished to hear some part of "Sandford and Merton."

"I cannot read both books at once," said their aunt. "Besides, I think it is too dark for me to read."

"Then tell us a good long story," said Emily.

"I do not recollect any new story, just now," replied her aunt.

"Then what shall we talk about?" asked Arthur in a sorrowful tone.

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"I think we shall find plenty to talk about in this very room," said his aunt. "I will ask each of you four questions about the different things in this room; and we will see if you can answer them."

"Oh," said Emily "I am sure I know all the things in this room, for I have seen them more than a hundred times. Ask me the first question if you please, aunt Lucy."

"Well, then, what is the name of the tree that is cut into these deal boards, with which the room is floored?"

"I suppose it is the deal-tree, aunt," said Emily.

"No, that is not the name," said Arthur, "I know what it is. It is a kind of fir-tree, is it not?"

"Yes," replied his aunt, "you are right."

"Can you tell me from what part of the world the fir comes?"

I am almost sure I can," answered Arthur: "do not tell me aunt,—it is a cold country. Mamma told me the name the other day. Norway, that is the name of one country, and Sweden is the name of the other, which is close to it. They are full of mountains, and waterfalls, and great forests. Mamma told me, you may travel hundreds of miles and not come to the end of the forests—nothing to be seen but dark, dark fir-trees. The people fell those trees only that are near the rivers, to send to

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other countries, because they can easily float the timber down the rivers to the sea, and then it may be carried away in ships. They are obliged to leave the large forests, which grow at a distance from the water, because it would be difficult and expensive to carry the timber to the water's side. I do not think I know much more about fir-trees, aunt."

"You have answered the question pretty well," said his aunt; "but we have fir-timber from Scotland, and also from North America. I believe however, that the fir from Norway and Sweden, is considered the best. Turpentine, tar, and pitch, come from the fir-tree. Turpentine, you know, is used in large quantities, to mix with colours for house-painting, and various other purposes. Have you ever heard how it is procured?"

"No, do tell us," said Arthur.

"People bore holes in the trunks of the fir-tree, early in the spring, and place jars for the juice which runs out of the holes; this juice is called turpentine."

"Oh," said Arthur, "that is the same way the Indians in South America get Indian rubber juice, from the Indian rubber tree. But the Indian rubber juice soon becomes hard like leather. Does the juice of the fir-tree also become hard, aunt?"

"No, I do not think it does, my dear. Now for the question for your sister."

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“What is the use of tar, Emily?”

“They smear the rigging of ships with it. All the sails of the fishing-boats at Brighton were tarred. Mamma told me the wet did not easily soak through the tar, and that if the sails were always wet, they would soon become rotten. I think I have seen palings tarred. Tar is very useful, is it not?”

“And I am sure pitch is useful,” said Arthur. “Boats and ships, and barns, and huts, are pitched; but you did not tell us, aunt, how tar and pitch are made from the fir-tree.”

“To procure the tar, the roots of the fir-trees are burnt in a funnel-shaped vessel, which is covered at the top with tiles, or pieces of turf, to prevent the roots when lighted from burning too quickly. The tar trickles out of the wood, and falls to the bottom of the vessel, from which it is collected, and afterwards poured into barrels for sale. Pitch is tar boiled, I believe, with a great deal of water. When it is cool, it becomes hard, but it can easily be melted again.”

“I wish mamma would let me pitch the railings of my little garden,” said Arthur. “I should like it much better than to have them painted.”

“Oh, it would not be nearly so pretty,” said Emily. “Green paint is much better than dark pitch.”

“Ah, but pitch would make them last a great deal

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longer," observed Arthur. "Can you tell us something more about fir-trees, aunt?"

"Yes, Arthur, I read the other day an interesting account of the great fires that take place in the fir forests of Sweden. The traveller in that country has occasionally seen a great part of the sky look red from the burning of a whole forest, which was blazing for many miles. This is sometimes caused by the Swedes setting fire to the trees, on purpose that the ground might be quickly cleared for sowing corn, which will not grow under the shade of so many trees."

"I suppose," said Arthur, "that it would take the Swedes too long a time to cut down every tree; but what a great bonfire it must make!"

"It is but seldom that the forests are purposely set on fire," said his aunt. "These great fires generally take place from the carelessness of the people, who leave the hot tinder from their tobacco-pipes among the dry moss and leaves. The Swedes light fires at night, to keep the mosquitoes from stinging them or their cattle, and when they drive their cattle to other places they sometimes are so foolish as to leave the fires lighted."

"But, aunt," said Arthur, "if the Swedes wish the ground to be cleared, the fire is a good thing."

"You forget, Arthur," said his aunt, "that there are many villages, or farm-houses, close to some of

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these forests ; and of course the Swedes do not wish the houses, and farms, and barns to be burnt. Besides, even when the flames do not reach any houses, the poor farmers are greatly injured. The great heat, and the loud noise of tree after tree burning and splitting in the flames, drive the bears, wolves, and foxes from their dens and holes, and they become fierce. I have heard that in one night six cows and twelve sheep have been killed by a single bear."

"How sorry the poor farmers must be," said Arthur. "I am glad we have no bears and wolves in this country."

"So am I," said Emily. "Let me answer your next question, aunt."

"It is not your turn, Emily," said Arthur, "but never mind, you may answer."

"Thank you, Arthur. Now aunt," said Emily.

"What are these linen sheets made of, Emily, that nurse is placing in baby's cradle?"

"I am glad I know that," exclaimed Emily. "They are made from the flax plant. Papa showed me the pretty blue flowers, about as large as a shilling the other day.

He told me that when the plant was soaked in water



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for several days, the outside of the stem peeled off and split into many threads; fibres I think he called them. Then the fibres are beaten to make them separate easily, and combed, and cleaned, and afterwards spun to be woven into linen cloth. Papa told me something about its Latin name, but I forget that."

"But I do not forget, aunt," said Arthur, "papa said that the Latin name was '*Linum*,' and that people have only altered the word a little, in calling the cloth made from flax *linen*. I should not have recollected the Latin name better than Emily, if the sound had not been something like that of the word linen; and now, when I think of the one, I think of the other. My turn next, aunt Lucy."

"Is the flax plant useful for anything else besides linen?" asked his aunt.

"Oh, dear me, I cannot recollect; I do not think I know. Do you, Emily?"

"No; I do not know. What is it, aunt?"

"The seeds, when ripe, are pressed," answered her aunt, "and a useful kind of oil, called linseed oil, is procured from them. After the oil has been taken from the seeds, the pressed lumps of seed are given to cattle to eat. They grow very fat upon this food, which is called linseed-cake. Many birds are also very fond of linseed."

"What a useful plant flax is," exclaimed Arthur. "I wonder who thought of using it first for linen."

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When it is growing, it does not look in the least as if it could be made into white thread."

"The name of the person is not known, my dear," replied his aunt, "nor is it known in what country the plant was first used. Egypt was famous for its linen, a long, long time ago. There are pieces of Egyptian linen in the British Museum, that must be at least three thousand years old."

"Now for another question, Emily. Where do coals come from?"

"Oh aunt, you may be sure I know that," replied Emily, quickly: "they are dug out of the earth, from large holes called coal mines, in different parts of England."

"But, aunt Lucy," said Arthur, "is the coal solid, like rock, in those places where it is found?"

"No, Arthur, the coal lies in large beds, between beds of earth or clay, or limestone, just like your hands and mine placed open one above another. Fancy my upper hand to be the earth, then your hand the bed of coal, then mine a bed of clay or limestone, then your hand the coal again. Sometimes these beds are nearly flat, like our hands, and sometimes they are curved, like the inside of a basin."

"Or like our hands are now," said Arthur, "when we bend them up. Are there a great many beds of coal, one under another, aunt? because if there are, the miners must dig very deep indeed."

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“In some parts of the country,” replied his aunt, “the beds of coal appear almost on the surface of the ground, and then the coal can of course be procured without much trouble; but in those mines where the best coal is obtained, there are, perhaps, as many as twenty beds of coal. Out of this number, there may be only four or five worth working; as some are frequently only a few inches thick, or are mixed with earth, while other beds may be twelve or fourteen feet in thickness, and be free from earth. Some of these beds of coal extend to a great distance, and are worked eight hundred feet below the surface of the ground.”

“I do not understand the shape of the coal mine, aunt,” said Emily. “Is it like a very large hole? Do tell us all about a mine. What does the miner do first?”

“He digs a hole like a well, only much larger, to the bottom of the first bed of coal. This hole is called the shaft. Then the miner begins to clear out the coal, along the bed of coal, in various directions, making so many passages, or galleries, as they are called. When he has proceeded a short distance, he sometimes leaves the galleries, and digs the shaft still deeper, to the bottom of the second bed of coal; because it is often necessary to mix the coal from the different beds. After he has worked some time in the second bed, he digs the shaft deeper still, and so

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he continues till he has reached all the beds worth working."

"I wonder," said Arthur, "the roofs of these different galleries do not tumble upon the miners and kill them. What a weight they must be!"

"They would certainly fall, Arthur," said his aunt, "if the miners were not careful to leave immense pillars, to support the roof. These pillars are placed near one another."

"Then, aunt," said Emily, "when people are walking near the shaft of a coal mine, they are walking over long passages and spacious rooms, with coal walls, and ceilings, and floors, where men are working as hard as they can, digging up coals for our fires."

"And if there are a great many beds of coal, aunt," said Arthur, "there must be a great many galleries and rooms, one under the other. But how do the miners get up and down the shaft? for I suppose they do not live in the mine always."

"No, my dear. Most of the miners, if not all of them, come up after their day's work is done, to their wives and families, who live in cottages near the mines. Both the miners, and the coal which they dig, are brought up in large strong baskets, which are slung from a crane at the top of the shaft by stout chains, and are drawn up by machinery. When the men wish to descend, they are lowered in

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the same manner. The horses are raised or lowered in strong nets. In some mines, particularly at a very large mine at Whitehaven, the entrance is not by a shaft, but by a road, which descends into the lowest part of the mine, cut through the rock. The mine at Whitehaven is dug under the sea, about six hundred feet below the surface of the ground."

"I do not think I should like to go into that mine," said Emily.

"I believe it is quite safe; for it has been worked for many years. In very stormy weather I should think the miners must feel a *little* fearful, for it is said that the noise of the dashing and roaring of the waves can then be distinctly heard."

"But why do they work that mine?" said Arthur; "is it such a very good one?"

"Yes," replied his aunt, "it is one of the best in the world. It is supposed that that mine might be worked for a thousand years and not be exhausted. The coal is particularly abundant in the direction of the sea."

"Are the miners obliged, aunt," said Arthur, "when they want to go from one gallery to the other, to return every time to the great shaft, and be pulled up or lowered in the basket, till they reach the gallery they wish to work in?"

"No; that would be a very inconvenient plan,"

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answered his aunt. "The miners dig holes, like the shaft, only much smaller, in different parts of the mine, from one bed to another, and then they can easily climb from one gallery to another by means of a rope; or they can let the coal up and down in small baskets. These holes are also useful to let the air pass more freely into all the galleries. In the larger galleries, horses drag the coal in small waggons, or sledges, from one end of the gallery to the shaft, where the baskets are filled with coal and hauled up."

"I should not like to work in a mine," said Arthur, "without any light but a gloomy lamp. I think a mine must be a very dismal place."

"Oh, you might easily get used to the dim light: there are, however, dangers which are really serious. But I hear papa call us, so let us go into the parlour."

"Oh, aunt Lucy, you have not asked us half questions enough yet," exclaimed Emily.

"And I want to know a great deal more about the mine," said Arthur.

"Let us have another pleasant chat, aunt, to-morrow evening," said Emily.

"We will if you wish, my dear," said her aunt.

"Thank you, thank you," said both the children at once.

A RAINY MORNING.

ONE morn, a young bee, just awakened from sleep,
Made haste at the hive's little entrance to peep :—
She longed to make trial of newly-found powers,
To bask in the sunbeams, and taste of the flowers.
But hard-pelting raindrops forbade her to roam,
She must stay in the hive, and be prisoner at home.
“ Alas ! ” hummed the bee, “ this sad rain will destroy
Those beautiful flowers I hoped to enjoy ;
The blossoms will fall from the sweet-scented lime ;
We shall gather no honey from jasmine or thyme :
I had thought the whole meadow and wood to ex-
plore,—
Now nothing remains but to feast on our store.”
—“ Ah no,” quoth an old bee, “ while showers confine,
We have part of our hive to fresh varnish and line ;
The babes in the cradle are needing our care,—
We have six cells to build, and the queen's to repair.

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So you see, my young friend, we have plenty to do,
Ere sunshine invites us our flight to renew.

We have no time to be idle, and blame not these
showers ;

For rain, I assure you, refreshes the flowers ;

The clover will soon be an exquisite treat,

The jasmine more juicy, the bean-field more sweet !”

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